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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

IN RE: CATHODE RAY TUBE (CRT) ANTITRUST LITIGATION	Master File No. CV-07-5944 SC MDL No. 1917 **EXPERT REPORT OF JANET S. NETZ, PH.D**
This document relates to: **ALL INDIRECT PURCHASER ACTIONS**	The Honorable Samuel Conti

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I. Qualifications

I, Janet S. Netz, am a founding partner of applEcon, LLC. I have been a tenured Associate Professor of Economics at Purdue University and a Visiting Associate Professor at the University of Michigan. I received a B.A. (1986) from the University of California, Berkeley, *cum laude*, and an M.A. (1990) and Ph.D. (1992) from the University of Michigan, all in the field of economics. My doctoral fields were Industrial Organization, which is the study of firms and markets, the economic field most closely related to the issues in this case specifically and in antitrust generally, and International Trade, which includes the study of firms and markets in a global environment.

Among the courses that I have taught, those that are most closely related to the issues of this case include Industrial Organization at the undergraduate and doctoral level; Antitrust and Regulation at the undergraduate level; Microeconomic Theory at the undergraduate and master's level; and International Trade at the undergraduate and master's levels. I have guest lectured on the role of an economic expert in an Alternative Dispute Resolution class at the University of Michigan Law School. I have spoken on the role of economists and economics in class action antitrust cases at several American Bar Association conference programs. My research has focused on competitive interactions of firms and strategies firms can use to increase profits. I have published in peer-reviewed, scholarly journals and have presented my research at many conferences and seminars. A detailed account of my academic employment and publication histories is provided in my curriculum vitae, which is attached as Exhibit A.

I have testified in trial or by affidavit or declaration, especially with regard to the determination of the impact of anti-competitive conduct on consumers and quantifying the magnitude of the impact, for over ten years. In addition, I have consulted on numerous antitrust cases. I provide a list of the cases on which I have testified and consulted in my curriculum vitae, which is attached as Exhibit A.

I am compensated for my work on this case at the rate of $450 per hour. My compensation is not dependent on my opinions or the outcome of the case.

II. Summary of Plaintiffs' claims

A. Definition of class and sub-classes

The Plaintiffs allege that the price-fixing conspiracy extends from at least 1 March 1995 through 25 November 2007. The State-Wide Classes are defined as:

> All persons and entities in [Indirect-Purchaser State] who, from March 1, 1995 to November 25, 2007, as residents of [Indirect-Purchaser State], purchased Cathode Ray Tubes incorporated in televisions and monitors in [Indirect-Purchaser State] indirectly from any defendant or subsidiary thereof, or any named affiliate or any named co-conspirator, for their own use and not for resale. Specifically excluded from this Class are defendants; the officers, directors, or employees of any defendant; the parent companies and subsidiaries of any defendant; the legal representatives and heirs or assigns of any defendant; and the named affiliates and co-conspirators. Also excluded are any federal, state, or local

> governmental entities, any judicial officers presiding over this action, members of their immediate families and judicial staffs, and any juror assigned to this action.[1]

The indirect purchaser states include: Arizona, California, District of Columbia, Florida, Hawaii, Iowa, Kansas, Maine, Michigan, Minnesota, Mississippi, Nebraska, Nevada, New Mexico, New York, North Carolina, North Dakota, South Dakota, Tennessee, Vermont, West Virginia, and Wisconsin. The applicable class period for Hawaii, Nebraska, and Nevada begins from June 25, 2002, July 20, 2002, and February 4, 1999, respectively.[2]

CRT products are defined as color display tubes (CDTs) which are used in computer monitors and color picture tubes (CPTs) which are used in TVs. CRT products also include the finished TVs and computer monitors containing CPTs and CDTs, respectively.[3]

The economic analysis that I describe below applies to the state classes. Unless expressed otherwise or the context clearly indicates otherwise, I will refer to the class or class members, meaning all Indirect Purchaser State Classes.

B. Membership of the cartel

The CRT cartel was comprised of: fourteen Defendants (BMCC, Chunghwa, Daewoo/Orion, Hitachi, IRICO, LG Electronics, LPD, Matsushita, MTPD, Philips, Samsung, Samtel, Thai CRT, and Toshiba; Daewoo/Orion, LPD, and Thai CRT no longer exist) and three companies that Plaintiffs have named as Co-Conspirators and with whom Plaintiffs have entered into a tolling agreement (Thomson, Mitsubishi, and Videocon).[4]

C. Cartelization of the CRT industry

At least as early as 1995, Defendants began colluding in an effort to raise CRT prices and profits above the competitive level. The conspiracy encompassed both CPTs and CDTs, and lasted at least twelve years, including the years during which CRT demand declined due to the advent of LCD (liquid crystal display) technology.

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[1] 20 June 2013, Report and Recommendation Regarding Indirect Purchaser Plaintiffs' Motion for Class Certification, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division), at 40-47 (listing statewide damages classes); 24 September 2013, Order Adopting Special Master's Reports and Recommendations on Defendants' Motion to Exclude Expert Testimony and Indirect-Purchaser Plaintiffs' Motion for Class Certification, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

[2] 01 October 2012, Memorandum of Points and Authorities in Support of Motion of Indirect-Purchaser Plaintiffs for Class Certification, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "IPPs Memo in Support of Class Cert."), at 2.

[3] This excludes certain products that are CRT-based but not in the case (i.e., rear projection products). 10 January 2013, Indirect Purchaser Plaintiffs' Fourth Consolidated Amended Complaint, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco) (Hereinafter "Complaint").

[4] Complaint, at , ¶¶ 50-115.

During the twelve years of the conspiracy,[5] a cartel monopolized the manufacture of CRTs. The cartel's membership included most of the largest CRT manufacturers. Monopolization of CRTs was effected by a variety of mechanisms, including: the cartel meeting to fix prices and to restrict production and capacity, with top management in regular attendance. In addition, the CRT cartel fixed market shares among cartel members; allocated customers to cartel members; shared information, such as capacity and output, not ordinarily shared with competitors; and created opportunities for managers of "competing" companies to build trust through socialization.[6]

The cartel set up multilateral meetings of representatives of cartel members it called "Glass Meetings", and established three other types of meetings, "Top Meetings" attended by top executives such as vice presidents and chief operating officers of cartel members; "Management Meetings"; and "Working-Level Meetings".[7] The latter two types of meetings were generally held monthly, and at times as frequently as weekly.[8] In addition, "Green Meetings" were planned on golf courses to follow Glass Meetings "in order to make friendly contacts and strengthen mutual trust".[9]

Defendants have produced documents related to Glass Meetings, such as meeting notes taken by representatives of member firms, and documents that appear to have been used at meetings of the cartel, such as meeting agendas and slide presentations. To date, I have found documents related to over 130 meetings at which the cartel members discussed and agreed to prices they would

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[5] The CRT cartel's operations spanned the years 1995 through 2007. The class period begins at least as early as March 1, 1995 and ends no earlier than November 25, 2007. Complaint, at 1.

[6] Complaint.

[7] Complaint, ¶¶ 147-150. Section VIII.A.3.a).

[8] See, e.g.,

- Notes of a meeting between Samsung, Philips, LG Orion and CPT state: "CPT suggested that weekly meeting shall be called to review price increase status, all makers agreed and set a Meeting at CPT Yang MEI factory on 3/27'97 at 9:30 AM, and setup the following dates for future meetings as follows for the time being: 4/2: PH Taipei, 4/9: LG, 4/16: Daewoo 4/23: SDD In order to strengthen communication, ensure price increases to succeed smoothly." Chunghwa Picture Tubes, LTD, 19 March 1997, Customer Contact Report, CHU00028752 - CHU00028754, at 8753.01E (emphasis supplied).
- "Review of the implementation method of the Working Level weekly meeting: Each maker indicated that because of the success of Glass Meeting, everybody has been Enjoying Business this year. Now that the Slow Season is coming, everybody should continue to strengthen communications and contacts, so the weekly meetings should continue to be held on time." Chunghwa Picture Tubes, LTD, 09 November 1999, Visitation Report, CHU00030916 - CHU00030918, at 0916.02E (emphasis supplied).

[9] See, e.g.,

- "[I]n order to make friendly contacts and strengthen mutual trust, the makers agreed that every 3-4 weeks they would take turns to host a Green Meeting (only two members from each maker) after the meeting is over." Chunghwa Picture Tubes, LTD, 09 November 1999, Visitation Report, CHU00030916 - CHU00030918, at 0916.02E.
- A Green Meeting was held at Country Height Golf Resort on 6 March 1999. Report (Submitted), CHU00021268 - CHU00021276, at 1268.01E.
- A Green Meeting was held at Palm Garden Golf Club on 24 February 2005. Chunghwa Picture Tubes, LTD, 24 February 2005, CHU00661917, CHU00661917 - CHU00661928, at 1917.

charge for CRTs; see Exhibit 1 for a list of cartel documents that evidence cartel meetings at which prices were fixed or confirmed.

The CRT cartel also colluded to divide the CRT market, by a variety of means. The simplest division of the market was an agreement regarding shares of the overall CRT market among cartel members. The cartel also reached agreements by which cartel members were given a share of a particular customer's business, or an exclusive right to certain large customers. Some cartel members were implicitly awarded a larger share of certain large customers. They were authorized to charge a lower price to that customer than the price allowed to be charged by other suppliers. I give a fuller accounting of the conduct of the CRT cartel below, in Section VIII.A.3.

III. Competition agencies investigated and fined cartel members

Chunghwa began cooperating with competition authorities in several countries in early 2007 and competition authorities raided CRT manufacturers in November 2007.[10] Numerous criminal and civil complaints followed both in the United States and abroad.

In the United States, the Department of Justice (DOJ) has, to date, indicted six former executives for participation in the CRT cartel.[11] In March 2011, Samsung SDI agreed to plead guilty and pay a $32 million fine to the DOJ for its participation in the CDT cartel.[12]

The European Commission (EC), Korean Fair Trade Commission (KFTC) and Japanese Fair Trade Commission (JFTC) all concluded that cartel members colluded to fix prices, restrict output and allocate customers.[13] The EC levied fines totaling €1.47 billion ($1.92 billion), the KFTC levied fines of ₩26.3 billion ($23 million), and the JFTC fined cartel members ¥3.3 billion ($37 million). The latter was notable in that it represented the first time the JFTC had fined foreign-based firms for violations of Japanese competition law.[14]

IV. My assignment

[10] European Commission, 19 October 2013, Final Report of the Hearing Officer TV and Computer Monitor Tubes, Official Journal of the European Union.

[11] United States Department of Justice, 09 November 2010, Three Former Executives Indicted in Color Display Tube Price-Fixing Conspiracy, http://www.justice.gov/atr/public/press_releases/2010/264069.htm, accessed 18 November 2013.

[12] United States Department of Justice, 18 March 2011, Samsung SDI Agrees to Plead Guilty in Color Display Tube Price-Fixing Conspiracy, http://www.justice.gov/atr/public/press_releases/2011/268592.htm, accessed 18 November 2013.

[13] See, e.g.,

- European Commission, 05 December 2012, Antitrust: Commission fines producers of TV and computer monitor tubes €1.47 billion for two decade long cartels, Official Journal of the European Union.
- Korean Fair Trade Commission, 10 March 2011, Multi-party Meeting, 2010Gukka234, Decision no. 2011-019.
- McKenzie, Liz, 07 October 2009, JFTC Slams Samsung, MT Picture In CRT Cartel Probe, Law360, http://competition.law360.com/print_article/126904, accessed 08 October 2009.

[14] See, e.g.,

- McKenzie, Liz, 07 October 2009, JFTC Slams Samsung, MT Picture In CRT Cartel Probe, Law360, http://competition.law360.com/print_article/126904, accessed 08 October 2009.

I was asked by Plaintiffs' counsel to evaluate the impact of the alleged cartel and to quantify the magnitude of the harm, if any, to class members. There is no question that Defendants engaged in many types of prohibited collusive conduct including sharing competitively sensitive information, setting target prices, and restricting output. The economic questions I addressed in my economic analysis of the cartel's impact include:

1. Were the characteristics of the industry and cartel suitable to allowing a cartel to increase price above the competitive level?
2. Were the actions of the cartel successful at raising prices to direct purchasers?
3. Would at least some portion of any overcharge to direct purchasers be passed through to class members who purchased CRT monitors and TVs for personal use?
4. What is an economically reasonable estimate of the overcharge imposed by cartel members on direct purchasers?
5. What is an economically reasonable estimate of the pass-through rate of any overcharge to class members?
6. Given economically reasonable estimates of the overcharge and pass-through, what is the harm imposed on class members?

To perform these analyses and calculations, my staff, under my guidance, and I reviewed numerous materials on which I based my conclusions. This material includes documents and data produced in the discovery process of the case, as well as publicly available documents relating to the CRT industry. The latter includes, but is not limited to, company SEC filings, Annual Reports, press releases, CRT and display industry reports, news and journal articles, white papers and presentations from research firms, and CRT-related websites.

To the best of my ability, I kept track of the materials reviewed. In Exhibits B and C, I provide a list of all confidential and public documents, respectively, that my staff and I have reviewed to date. I reserve the right to revise my conclusions and opinions as more information comes to light.

V. Summary of my conclusions

I investigated the economic characteristics of CRTs, CRT manufacturing, CRT industry structure, firms that manufacture CRTs, and how CRTs are distributed from CRT manufacturers to class members (end users). I found that CRTs have a small number of product characteristics that are economically significant and that manufacturing is subject to barriers to entry. In addition, I found that the CRT industry was a so-called "sick industry"; that is, there was falling demand and excess capacity throughout the damages period. While the manufacture of CRTs was subject to collusion, the manufacture, distribution, and sales of CRT monitors and TVs were highly competitive. I describe the analyses and facts that support my conclusions in Section VI.

I conclude that the following findings from the economic study of cartels are relevant to the analysis of whether the CRT cartel was effective in raising price above the competitive level and quantifying that impact:

- A cartel can be effective even if the price charged by the cartel declines over time by reducing the magnitude of the price decline and/or by reducing the speed of the price decline.

- Cartel success is a matter of degree. So long as the cartel is able to raise price above the competitive level, the cartel is successful, even if it is not able to set price equal to the monopoly level. Similarly, a cartel can increase price above the competitive level even in the presence of some degree of cheating.
- A cartel that is made up of vertically integrated and unintegrated firms can successfully increase price above the competitive level.

I briefly describe these conclusions in Section VII and I explain why these conclusions hold in Appendix 1.

I next examined whether the CRT cartel had the market power necessary to raise the price of CRTs above the competitive level. I find that neither entry from other CRT manufacturers nor the development of LCD display technology prevented the cartel from exercising market power. I describe the analyses and factual foundation for my conclusion in Section VIII.A.2. I then investigated the mechanisms used by the cartel. These included extensive and frequent face-to-face meetings, phone calls, and electronic communications; plans to reduce production and capacity; methods to monitor whether cartel members were abiding by agreements; and allocating customers. I conclude that the result of these actions, described in Section VIII.A.3, was to increase the price of CRTs above the competitive level. I then looked for direct evidence that CRT prices were above the competitive level. Documentary evidence, as described in Section VIII.A.1, showed that the cartel and members themselves proclaimed their success. Finally, I undertook regression analyses of the prices charged to determine whether they were determined by the target prices set by the cartel members. The results from the regression analyses, described in Sections VIII.A.4.a) and VIII.A.4.b), confirm my conclusion that the cartel was successful in raising price above the competitive level.

I investigated whether price changes in the price of CRTs were passed through to class members (end users) via the prices of CRT monitors and TVs. The implication of economic theory is clear: a price increase that is not insignificant, non-transitory, and industry-wide is passed on to the next level in the chain of distribution. Pass-through is also a matter of degree; class members are harmed as long as any portion of the overcharge is passed down the distribution chain. An examination of the documentary and testimonial evidence and the facts of the industry and case further support my conclusion that class members were harmed as a result of the cartel's actions. I describe the analysis of pass-through in Section VIII.B.

I then turn to tools that allow me to quantify the degree of harm Defendants imposed on class members. I proceed by first estimating the overcharge imposed by cartel members on direct purchasers; then estimating the portion of the overcharge that was passed through to class members; and finally using the overcharge and pass-through rates in conjunction with expenditures by class members on CRTs to calculate the total damage suffered by the class as a result of the increased price. As described in Section IX, I conclude, on the basis of my examination of the data, that CDTs (the CRTs used to make monitors) were overcharged at the rate of 25.0% for 1995Q2-2006Q4 and 12.3% for 2007Q1 to 2007Q4 and CPTs (the CRTs used to make TVs) were overcharged at the rate of 9.5% and 3.2%. I conclude that at least 100% of the overcharge was passed through to class members, based on the evidence presented in Section X. Finally, I calculate that the damages borne by class members who purchased CRT monitors was $2.296 billion and CRT TVs was $780 million, for a total of $3.076 billion.

VI. The CRT industry

In order to perform a proper economic damages analysis, I first consider the relevant economic nature of CRTs, CRT manufacturing, and the CRT industry. A factual understanding of CRTs and the CRT industry leads to the conclusion that, absent the cartel, the industry could have been expected to be quite competitive, possibly ruinously so.

The cathode ray tube (CRT) is a mature display technology widely used in televisions and computer monitors in the late-1990s and the first decade of the 21st century. CRTs operate by shining an electron beam onto a phosphor-coated panel, causing the phosphors to glow, emitting red, green, and blue light to compose a picture. The CRTs relevant to the present case range in size from 14" to 42".

A. CRT product description

1. The basic components of CRTs

CRTs operate by shining a beam of electrons on a screen that is coated with material that glows when the electron beam strikes it. The primary components of a CRT are a large glass bulb containing an electron gun and a pair of devices near the rear of the bulb that focus and aim the electron beam. The bulb is comprised of two elements. The front of the bulb is called the panel; this is the screen the viewer observes. It is coated on the inside with phosphors that glow when the electron beam strikes them, emitting red, green, or blue light. The remainder of the bulb is called the funnel, because of its funnel shape. The electron gun is housed inside the neck of the funnel. Around the outside of the neck are the convergence purity magnets (CPM) and the deflection yoke. The CPM focuses the electron beam. The deflection yoke, sometimes called a deflection coil, aims the electron beam. It scans the electron beam back and forth and up and down across the screen.[15] The CRT creates a picture by turning the electron gun on and off as the deflection yoke moves the beam across the screen, thereby exciting (illuminating) the appropriate color phosphors in the proper locations to create the full color picture. The mask is an additional component inside the bulb, very close to the inside surface of the panel. Its purpose is to absorb stray electrons to ensure that electrons strike only the phosphors that are supposed to be illuminated.

2. CRTs have a small number of economically significant dimensions of product differentiation

CRTs are differentiated products. The primary dimensions of differentiation are the application, size, shape, and finish. Additional differentiation comes from different resolutions and the use of various coatings and mask type, but these differences have a much smaller effect on price differences than do differences across the primary dimensions of differentiation.

CRTs are sold primarily for use in two distinct applications: computer monitors and TVs. CRTs sold for use in monitors are called “color display tubes”, or CDTs;[16] CRTs sold for use in televisions are called “color picture tubes”, or CPTs. While the basic technologies of the two

[15] For a nice cutaway showing the main components of a CRT, see Engelsen, Daniel den, 15 June 2000, Manufacturing of CRTs 1, SDCRT-020298, at 4.

[16] Philips, and possibly some other firms, at times also refer to these as CMTs (computer monitor tubes). Philips, 12 April 1999, Strategy Review 1999-2003 Region North America, PHLP-CRT-088450, at 86.

tubes are similar, there are differences between them.[17] The two types of tubes are not functional or economic substitutes: a TV manufacturer could not and would not use a CDT and a monitor manufacturer could not and would not use a CPT.[18]

The second major type of differentiation is the size of the tubes. The size of the tube is typically measured diagonally across the screen, in either inches or centimeters.[19] The most common CDT

[17] See, e.g.,

- CPTs are designed for high brightness while high resolution is more important for CDTs. Different mask and phosphor structures are used for the two types of tubes. SDI, Undated, Model of SDI CRT Product, SDCRT-0021278 - SDCRT-0021294, at 1288-1289.
- CPTs generally use striped phosphors and aperture grilles or slotted masks, while CDTs use dot phosphors and hexagonal arrangement of openings in the mask. Engelsen, Daniel den, 15 June 2000, Manufacturing of CRTs 1, SDCRT-0202981, at 6 and 12.
- The dot pitch (resolution) of CDTs and CPTs are "totally different". 03 July 2012, Deposition of Hitachi Electronic Devices (USA) 30(b)(6) Witness Thomas Heiser (Hereinafter "Hitachi 30(b)(6) Deposition of Thomas Heiser, 03 July 2012"), at 59:16-24.
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[18] See, e.g.,

- CPTs lack the resolution to be used in monitors; CDTs cannot handle the power required in a television. 16 July 2012, Deposition of Panasonic Corporation, Panasonic North America and MTPD 30(b)(6) Witness Tatsuo Tobinaga (Hereinafter "Panasonic 30(b)(6) Deposition of Tatsuo Tobinaga,16 July 2012"), at 142:19-143:23.
- CPTs and CDTs have different masks. SDI, Undated, Model of SDI CRT Product, SDCRT-0021278 - SDCRT-0021294, at 1288.
- From Nobuhiko Kobayashi's Deposition: "Q. And when you talked about the differences among the shadow masks and resolution, did that testimony apply equally to CDTs as CPTs? A CPTs and CDTs are entirely different." 17 July 2012, Deposition of Hitachi Displays, Ltd. 30(b)(6) Witness Nobuhiko Kobayashi, Volume I (Hereinafter "Hitachi 30(b)(6) Deposition of Nobuhiko Kobayashi, Vol. I, 17 July 2012"), at 38:6 - 9.

[19] Generally, the sizes discussed are the size of the CRT itself. However, manufacturers also referenced tubes by their viewable area, e.g. 25-V or 25V. 31 July 2012, Deposition of Philips Electronics North America Corporation, Inc. and Koninklijke Philips Electronics N.V. 30(b)(6) Witness Roger De Moor (Hereinafter "Philips 30(b)(6) Deposition of Roger De Moor, 31 July 2012"), at 46:11-47:9.

sizes ranged from 14" to 21" during the damages period.[20] Most CPTs were between 14" and 34" during the damages period.[21]

The aspect ratio, which is the relationship between the width and height of the screen, is another type of differentiation. For most of the damages period, CRTs used a 4:3 aspect ratio. In the latter part of the damages period, "widescreen" CRTs started being made. These had an aspect ratio of 16:9.[22] Widescreen CPTs differ from traditional CPTs in more than just the aspect ratio: widescreen CPTs have both higher resolution and scanning frequencies than traditional CPTs.[23]

The flatness of the panel, which I refer to as the "shape", is another dimension of differentiation. The front panel of a CRT was traditionally a portion of a sphere. Over time, manufacturers increased the radius of curvature of the screens in order to make the screens flatter.[24] Eventually manufacturers were able to produce truly flat CRTs. These went by various names, including – pure flat, real flat, and Dynaflat.[25]

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[20] CDTs smaller than 14" are not observed in worldwide data from 1996-2006. CDTs larger than 21" are not observed in worldwide data from 1996-2000, and observations from 2005 – 2006 show that 21"+ CDTs comprise small shares of overall CDT production. See, e.g.,

- Samsung, 11 December 2003, Worldwide CDT Manufacturer's Status, SDCRT-0201291.
- DisplaySearch, 30 September 2005, Q3'05 Quarterly Desktop Monitor Shipment and Forecast Report, CHU00281352 - CHU00281923, at 1644.
- DisplaySearch, 30 March 2007, Q1'07 Quarterly Desktop Monitor Shipment and Forecast Report, CHU00154037 - CHU00154420, at 4389.

[21] CPTs smaller than 14" and larger than 34" comprise a small portion of worldwide CPT production from 2000 – 2006. MT Picture Display, November 2006, Untitled Spreadsheet, MTPD-0416090.

[22] Michael Milostan, Senior Manager of Toshiba America's technical staff in 2000, talking about wide screens before the International Trade Commission: "the SDTV [standard definition television; digital TV standards that essentially replicated the old analog standards] format is designed for the four by three aspect ratio. By comparison, wide-screen CPTs with the 16 by nine aspect ratio which are optimal types of CPT for HDTV [high definition television] broadcasts…And whether the standard becomes SDTV or HDTV is anything but certain. It would be a long time before the market sorts out the choices. In the meantime, conventional CPTs with four by three aspect ratios will remain the workhorse of the industry." United States International Trade Commission, 17 February 2000, United States International Trade Commission In the Matter of: Color Picture Tubes from Canada, Japan, Korea, and Singapore, SDCRT-0068880 - SDCRT-0069081, at 9015.

[23] The scanning frequency of a CRT describes the frequency at which the screen is repainted. "at the consumer electronics show that was held in Las Vegas just last month every and each Japanese Korean company [sic] heavily promoted and demonstrated 16-by-9 CRTs as the immediate answer for high-definition, digital TV in the market today." United States International Trade Commission, 17 February 2000, United States International Trade Commission In the Matter of: Color Picture Tubes from Canada, Japan, Korea, and Singapore, SDCRT-0068880 - SDCRT-0069081, at 8906.

[24] These tubes went by various names. Some specified the "flatness" in terms of a multiplier of 'R' – 1.0R, 1.3R, 1.5R, 1.7R, 2.0R – all referencing an increasing radius of curvature, and hence flatter, but still curved, screen. SDI, Undated, Model of SDI CRT Product, SDCRT-0021278 - SDCRT-0021294, at 1278. These were also described as "flat square" or "square flat" tubes because the tube corners were closer to square and the panel was closer to flat than older styles. 2000, The Different Types of CRT Monitors: From ShortNeck to FST [ca. 2000], PC Tech Guide, http://www.pctechguide.com/crt-monitors/the-different-types-of-crt-monitors-from-shortneck-to-fst, accessed 13 March 2012 at 2. MTPD ascribed "FS" (flat square) to 1.3R and 1.7R tubes. MT Picture Display, 20 January 2005, MTPDT FY2005-06 Business Plan, MTPD-0401227, at tab 'Product Lineup', Rows 45 & 47.

[25] See, e.g.,

Another type of differentiation across CRTs is the degree to which the CRT assembly is completed by the tube manufacturer, in particular with regard to whether or not the product shipped with a deflection yoke. When a CRT is shipped without a deflection yoke, it is called a "bare" CRT. A CRT with a deflection yoke is called an "integrated tube component" (ITC) CRT.[26]

I am aware of other variations among CRTs that the cartel members at times addressed in their discussions of tube pricing. For example, the shadow mask can be made of different materials, with Invar and aluminum killed steel (AK) being the two most frequently discussed.[27] For CDTs, resolution, indicated by the "dot pitch" (the distance between dots of the same color), was another type of differentiation.[28] Lastly, there are also different safety and performance standards for monitors that can affect the price.[29] As I demonstrated in my Class Certification Rebuttal Report, the price differences resulting from these product differences were relatively insignificant.[30]

The result of having a limited range of economically meaningful dimensions for product differentiation is that industry sales were heavily concentrated on a relatively small number of product families from each vendor.[31]

3. CRT manufacturers engage in design-in competition

In addition to the types of product differentiation just described, there are other differentiating factors among CRTs. While the factors just described generally resulted in differentiation of monitors and TVs, as valued by consumers, there are other attributes – e.g., subtle differences in the curvature of the tube where it meets the bezel of the TV or different electrical requirements – that are important to finished product manufacturers but not to end customers.

Due to the technical product differentiation that is necessary to the incorporation of tubes into monitors and TVs, competition among CRT vendors is for design-in, not each individual CRT

- Pure flat is truly flat. Panasonic, Undated, Panasonic Display Development Plan, MTPD-0570911, at 1.
- Dynaflat has a flat screen surface and a curved inner surface. Flatron has a perfectly flat screen surface and inner surface. Also, real flat indicates that the screen has flat screen surface. LG, Undated, Why Flatron?, LGE00060914, at 4-5.

[26] Hitachi 30(b)(6) Deposition of Thomas Heiser, 03 July 2012, at 44:4-20.

[27] Invar is high-nickel-content steel. AK steel is manufactured using aluminum powder in the foundry process to remove impurities from the steel. Invar resists deformation from heat (which is generated by electrons striking the mask) better than AK steel. SDI, Undated, Model of SDI CRT Product, SDCRT-0021278 - SDCRT-0021294, at 1279.

[28] 2012, What is the Dot Pitch of a Computer Monitor, PC Tech Guide, http://www.pctechguide.com/crt-monitors/what-is-the-dot-pitch-of-a-computer-monitor, accessed 13 March 2012.

[29] TCO and MPRII, frequently referenced in meeting note discussions about CDT prices, are safety standards promulgated by Sweden. PCTechGuide.Com, Undated, TCO Monitor Standards, http://www.pctechguide.com/crt-monitors/tco-monitor-standards, accessed 03 August 2012, at 0115.

[30] Netz, Janet S., 15 February 2013, Rebuttal Declaration of Janet S. Netz, Ph.D., in Support of Motion of Indirect-Purchaser Plaintiffs for Class Certification, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Netz Rebuttal") , at 12.

[31] Netz Rebuttal, at 10-12.

order. That is, when a TV or monitor manufacturer develops a new model, the CRT vendors compete to win the design.[32] Absent coordination among the bidders, competition for design wins could be fierce, with price being a major factor. Once a TV or monitor manufacturer has chosen a specific CRT as the basis for a given model of TV or monitor, it cannot readily substitute a different vendor's CRT into the finished product.[33] If the product maker wanted to switch to a different CRT from the same or another tube manufacturer, the TV or monitor manufacturer would instead design and produce an alternative monitor or TV model using a different vendor's tube.[34]

A CRT manufacturer might compete for a design win with an existing tube design, a variation of an existing design, or a completely new design. The concentration of each manufacturer's production in a very small range of models suggests manufacturers used existing designs for most design-in competitions.[35]

Despite the fact that a TV or monitor manufacturer cannot readily change the CRT used in a given design, they are not "locked-in" to a given CRT manufacturer's product. The TV or monitor manufacturer can substitute manufacturer A's CRT for manufacturer B's CRT by reducing production of the product using CRT B and increasing production of the product using CRT A. Thus, absent the cartel, TV and monitor manufacturers benefit from CRT competition at both the design stage and the production stage.

B. The economics of CRT manufacturing

CRT production occurs as a sequential process on a production line. Most CRT production lines are dedicated to producing a limited range of CRT products. Production lines can generally be modified to produce new products, with the difficulty of the modifications depending on how closely related the new product is to the existing capabilities of the line.

CRTs are produced in large factories. While most factories tend to have multiple production lines, there were several that had only one. CRT factories are typically capable of producing

[32] "Q. Okay. And how would the customer articulate its needs to HED/US? A. There was a whole design process that went on before a picture tube was ever sold. You'd have probably a six months to one year, depending upon the customer, that would be a design cycle where we knew they were coming out with a new television set, and our engineer, our sales engineer would begin to work with them on the specification, what they wanted, what kind of performance, what kind of pinning specification, for example, how fine did they want it Pinned, what would they allow for convergence, or for – there were various other specifications you'd use on how the yoke was going to perform. Trapezoidal. There was many different parts of it, and those would all be called out in that design specification." Hitachi 30(b)(6) Deposition of Thomas Heiser, 03 July 2012, at 69:2-17.

[33] This is because of significant differences across CRTs that, unlike the size, shape, and other differences described earlier in the text, are not manifested in the appearance of the tube. For example, different tubes use different electron guns and deflection yokes, giving tubes from different vendors unique electrical requirements, and the shape of the outer edges of the screen are different across different tubes, requiring different faceplate or bezel shapes to mate with them.

[34] "Generally what would have to happen is customers would either have to do custom design around our specific tube type because our mechanics were different. So, or if they decided to try to so-called dual source, they needed to have two separate types of chassis due to the mechanical, some of the electrical differences of our product." 31 July 2012, Deposition of Toshiba America Electronics Corporation 30(b)(6) Witness Jay Alan Heinecke (Hereinafter "TAEC 30(b)(6) Deposition of Jay Alan Heinecke, 31 July 2012"), at 38:8-39:2.

[35] For evidence showing the concentration of each manufacturer's CRT output in a few product families, see Netz Rebuttal report, at 10-12.

between 100,000 and 1 million CRTs per month, with the largest factories able to produce over 1.5 million CRTs per month. See Exhibit 2.

1. The general CRT production process

CRT manufacturers typically acquire the major components – funnel, panel, electron gun, and mask – from other facilities.[36] Most of the major components have additional processing done to them at the CRT plant, then are assembled into a CRT. The manufacturing process prepares the mask and, separately, applies the phosphors and other coatings to the panel. The mask and panel are then mated. The funnel is also coated, then the funnel and panel are joined in a process called "frit sealing". The assembly is now called a "bulb". The electron gun is inserted into the neck of the funnel and the funnel is sealed around the gun. The tube is annealed (heated) to remove residual stress and a vacuum is drawn inside the tube. Lastly, an external band is wrapped around the front of the tube where the panel and funnel are joined. This band has "lags" on it which are used to attach the tube to the TV or monitor chassis or frame.[37] At this point the product is a CRT or a bare CRT.

Before the CRT can create pictures, the deflection yoke and related components must be installed and properly adjusted. Deflection yoke installation is the last step of the CRT manufacturing process.[38] In this step, referred to variously as the ITC ("integrated tube component") process,[39] "pinning",[40] or "matching",[41] the deflection yoke and focusing magnet are installed and adjusted to generate the best picture.[42] Depending on customer (finished product

[36] See, e.g.,

- A Chunghwa analysis of Japanese CRT manufacturers reports the main component suppliers for each CRT manufacturer. Chunghwa Picture Tubes, LTD, 1995, CRT Market Reporting Japanese Suppliers, CHU00028178 - CHU00028190, at 8179, 8182, 8184, and 8186.
- Some CRT manufacturers had "sister" companies that manufactured some of these components. See Chunghwa Picture Tubes, LTD, 14 March 2003, Chunghwa Picture Tubes, Ltd. and Subsidiaries Consolidated Financial Statements For The Years Ended December 31, 2002 and 2001 with Report of Independent Auditors, CHU00000207 - CHU00000259 at 0214 and 28 August 2006, Trustee's Second Report in the bankruptcies of LG.Philips Displays Holding B.V. and LG.Philips Displays Netherlands B.V. and LG.Philips Displays Investment B.V., http://deterinklive.com/nl/publicaties/faillissementsverslagen/l/, accessed 12 July 2012, at 25.
- Samsung made its own deflection yokes for high-end products, but purchased others. They made their own electron guns. They purchased glass and masks. 06 June 2012, Deposition of Samsung SDI 30(b)(6) Witness Jaein Lee, Volume I (Hereinafter "Samsung SDI 30(b)(6) Deposition of Jaein Lee, Vol. I, 06 June 2012"), at 101:21-102:20.

[37] See SDI, Undated, Model of SDI CRT Product, SDCRT-0021278 - SDCRT-0021294 at 1290 – 1294 and Engelsen, Daniel den, 15 June 2000, Manufacturing of CRTs 1, SDCRT-0202981.

[38] [redacted]

[39] Hitachi 30(b)(6) Deposition of Nobuhiko Kobayashi, 17 July 2012, at 22:11-23:6.

[40] Hitachi 30(b)(6) Deposition of Thomas Heiser, 03 July 2012, at 71:1-23.

[41] Philips 30(b)(6) Deposition of Roger De Moor, 31 July 2012, at 18:5-19:15.

[42] [redacted]

manufacturer) preferences, the yoke can be installed by the CRT manufacturer, the customer, or by third parties.[43] If the customer or a third party is performing the ITC process, the CRT can be sold without a deflection yoke, with the deflection yoke packed separately from the tube, or with the deflection yoke on the tube but not pinned.[44] Once the deflection yoke is installed and pinned, the product is an ITC or ITC CRT.

2. Production line flexibility allows for supply side substitution

Although there is almost no demand substitution between CDTs and CPTs, CRT production facilities have some capability for supply substitution by converting CRT production lines from producing tubes for one application to producing tubes of the other type. A few lines were capable of producing either type, with the switch from one type to the other needing relatively little time.[45] The line status reports[46] suggest that out of 322 lines that exhibited positive capacity covered by the reports, only 14 lines regularly or repeatedly produced both tube types; see Exhibit 3. However, switching production lines between CDTs and CPTs was relatively rare. Most CRT production lines produced exclusively CDTs or CPTs; see Exhibit 3. Of the 322 lines reported in the line status reports as having produced CRTs, at most 33 appear to have switched from producing exclusively CDT to exclusively CPT, or vice versa.

CRT production lines can relatively easily change the size of tubes they are producing. Almost all CRT production lines produced various size tubes over time and most were able to produce

[redacted]

[43] See, e.g.,

- Hitachi sold both bare and ITC CRT. When Hitachi's "Set Division" (a finished product manufacturer) bought bare tubes, it performed the ITC process. Hitachi 30(b)(6) Deposition of Nobuhiko Kobayashi, Vol. I, 17 July 2012, at 45:18-46:21.
- When Samsung sold bare CRTs, the deflection yoke would be installed by the customer. Samsung SDI 30(b)(6) Deposition of Jaein Lee, Vol. I, 06 June 2012, at 102:9-103:9.
- Hitachi outsourced the ITC process on occasion, over a period of several years. Samsung SDI 30(b)(6) Deposition of Jaein Lee, Vol. I, 06 June 2012, at 88:7-89:2.
- Philips's Ottawa plant sold some tube bare, some ITC, and some were shipped to a plant in Juarez, Mexico which performed the ITC process for Philips Consumer Electronics plant in Juarez. Philips 30(b)(6) Deposition of Roger De Moor, 31 July 2012, at 18:5-9:15.
- [redacted]

[44] For example, Samsung distinguished among bare (no deflection yoke or CPM), ITC (all components installed and adjusted to match finished product), "CKD" (complete knock down; ITC parts supplied but packed separately from CRT), and "SKD" (semi knock down; ITC parts installed but not adjusted). SDI, Undated, SDI CRT Model Number Decoder, SDCRT-0021274 - SDCRT-0021277, at 1277.

[45] For example, the #1 line at Samsung's Suwon plant could switch from making CDT to CPT or vice versa in about one shift, even though it required changing a lot of the production line. Samsung SDI 30(b)(6) Deposition of Jaein Lee, Vol. I, 06 June 2012, at 113:8-114:3.

[46] "Line status reports" are documents produced by various cartel members that track worldwide CRT capacity on a company-by-company, line-by-line basis.

different sizes at any given time; see Exhibit 2. Some lines were capable of producing multiple sizes intermixed, rather than running one size for a while then switching to another size.[47]

There are some costs to switch between two different tube specifications of a given size. For example, different customers might use different electron guns in the same basic tube, causing changes in how the guns were inserted. Adjusting lines for such changes might take two shifts.[48]

3. The nature of CRT production creates barriers to entry and sunk costs

CRT manufacturing is a capital-intensive process characterized by economies of scale. At the beginning of the damages period, viable CPT factories should produce at least 1.0 million tubes per year.[49] CRT manufacturing facilities were built for under $100 million to over $300 million.[50] CRT manufacturing facilities that make larger tubes generally cost more.[51] Adding

[47] "You could actually have a line going where your one device you're hanging in the rack may be a 19 and the next one could be a 20…" TAEC 30(b)(6) Deposition of Jay Alan Heinecke, 31 July 2012, at 84:10-12.

[48] TAEC 30(b)(6) Deposition of Jay Alan Heinecke, 31 July 2012, at 82:10-83:15.

[49] See, e.g.,

- Sony and LG each built plants planned to produce 1 million units per year. Telecompaper, 20 July 1994, Sony Electronics to Invest in Cathode Ray Tube Plant, http://www.telecompaper.com/news/sony-electronics-to-invest-in-cathode-ray-tube-plant, accessed 22 March 2012 at 1 and Telecompaper, 06 September 1995, LG Electronics to Invest in CRT Plant, http://www.telecompaper.com/news/lg-electronics-to-invest-in-crt-plant, accessed 22 March 2012.
- One author asserts the minimum efficient scale for a CRT plant was 1.5 million units per year. Kenney, Martin, Undated, The Shifting Value Chain: The Television Industry in North America, http://hcd.ucdavis.edu/faculty/webpages/kenney/articles_files/The%20Shifting%20Value%20Chain:%20The%20Television%20Industry%20in%20North%20America.pdf, accessed 19 April 2012, at 105. This document appears to have been written no later than 1 August 2003.
- Note that 1.5 million CRT per year is 125,000 tubes per month. Many individual lines had capacity in excess of 125,000 tubes per month. Individual production lines range in capacity from 20,000 to over 300,000 tubes per month.

[50] See e.g.,

- A new CRT facility will cost approximately 10 billion yen or 120-130 million US dollars. Panasonic 30(b)(6) Deposition of Tatsuo Tobinaga, 16 July 2012, at 146:8-147:8, 151:15-152:11.
- An LG plant in Korea, for the production of 24"-32" CPTs beginning in 1996, cost $125 million and was expected to produce 1 million CPTs per year. Telecompaper, 06 September 1995, LG Electronics to Invest in CRT Plant, http://www.telecompaper.com/news/lg-electronics-to-invest-in-crt-plant, accessed 22 March 2012.
- A Sony plant for 15" and 17" CDT with a capacity of 1 million units per year cost $50 million. Telecompaper, 20 July 1994, Sony Electronics to Invest in Cathode Ray Tube Plant, http://www.telecompaper.com/news/sony-electronics-to-invest-in-cathode-ray-tube-plant, accessed 22 March 2012, at 1.
- In the late 1980s a large screen (25" or more) CRT manufacturing facility generally cost between $200 and $300 million. Kenney, Martin, Undated, The Shifting Value Chain: The Television Industry in North America, http://hcd.ucdavis.edu/faculty/webpages/kenney/articles_files/The%20Shifting%20Value%20Chain:%20The%20Television%20Industry%20in%20North%20America.pdf, accessed 19 April 2012, at105.
- Pat Magrath of Georgetown Economic Services stated before the International Trade Commission on February 17, 2000 that CPT factories cost between $70 and $332 million to build. United States

capacity to an existing plant was also expensive.[52] In addition, CRT manufacturing required substantial ongoing investments in capital.[53]

Building a plant or adding a line also took a lot of time. Constructing the plant or line can take a year and require an additional year to get the completed line up to mass production.[54] For a line to reach full efficiency might take a further year or more of mass production.[55]

International Trade Commission, 17 February 2000, United States International Trade Commission In the Matter of: Color Picture Tubes from Canada, Japan, Korea, and Singapore, SDCRT-0068880 - SDCRT-0069081, at 8922.

[51] Kenney, Martin, Undated, The Shifting Value Chain: The Television Industry in North America, http://hcd.ucdavis.edu/faculty/webpages/kenney/articles_files/The%20Shifting%20Value%20Chain:%20The%20Television%20Industry%20in%20North%20America.pdf, accessed 19 April 2012, at 104-105.

[52] See, e.g.,

- LG Philips planned to spend $112 million installing two large/jumbo CPT lines at the Gomez Palacio plant in Mexico. ABN AMRO Bank, N.V., Citibank/Salomon Smith Barney Hong Kong Limited, et al., May 2001, LG.Philips Displays Holding B.V. US$2,000,000,000 Senior Term Loan and Revolving Credit Facility, PHLP-CRT-051982 - PHLP-CRT-052085, at 2046 and 2078.
- Adding a line could cost as much as $160 million. United States International Trade Commission, 17 February 2000, United States International Trade Commission In the Matter of: Color Picture Tubes from Canada, Japan, Korea, and Singapore, SDCRT-0068880 - SDCRT-0069081, at 8922.
- LG's investment plans for installing additional lines to produce its "Flatron" real flat CRTs ranged from 97 billion Won to 151 billion Won (at an exchange rate of 1200 Won per dollar, these convert to $80 million to $125 million per line). Salomon Smith Barney Inc., 22 May 2001, Project Mercury Confidential Information Memorandum, EIN0017699 - EIN0018075, at 7842.
- Philips spent $24 million on two small lines (80k/month capacity) producing 17" CDTs. Display Monitor, 22 May 2000, SGI Uses Quadro In New Workstations, Display Monitor, Vol. 7(20), HEDUS-CRT00166844 - HEDUS-CRT00166863, at 6844.

[53] See, e.g.,

- LG's investment plans for updating existing lines to produce its "Flatron" real flat CRTs ranged from 22 billion to 68 billion Won (at an exchange of 1200 Won per dollar, these convert to $18 million to $56 million). Salomon Smith Barney Inc., 22 May 2001, Project Mercury Confidential Information Memorandum, EIN0017699 - EIN0018075, at 7842.
- Toshiba invested over $150 million in its existing Horseheads, NY CRT plant in the five years up to March 2003. Panasonic, 27 March 2003, Matsushita and Toshiba To Launch North American Operations of New CRT Joint Venture, http://www.Panasonic.com/MECA/press_releases/toshiba_032703.pdf, accessed 10 July 2012, at 1. That is in addition to $220 million spent in the mid-1980s refurbishing and expanding the same facility. Kenney, Martin, Undated, The Shifting Value Chain: The Television Industry in North America, http://hcd.ucdavis.edu/faculty/webpages/kenney/articles_files/The%20Shifting%20Value%20Chain:%20The%20Television%20Industry%20in%20North%20America.pdf, accessed 19 April 2012, at 105.

[54] See, e.g.,

- Building a facility can take a year and another year is required to get the line up to mass production speeds. Panasonic 30(b)(6) Deposition of Tatsuo Tobinaga, 16 July 2012, at 146:8-147:8.
- It can take two years to complete a plant or add a line. Testimony of Pat Magrath, United States International Trade Commission, 17 February 2000, United States International Trade Commission In the Matter of: Color Picture Tubes from Canada, Japan, Korea, and Singapore, SDCRT-0068880 - SDCRT-0069081, at 8922.

On top of the time and capital required, there is substantial risk involved in establishing a new CRT facility or line. Despite CRT manufacturing being a mature technology, manufacturers sometimes were unable to develop economical production on a given line or of a given product.[56]

As an example, Philips established a plant in Nanjing, China, with an initial investment of $100 million. The plant installed five production lines in two stages, three lines in the third quarter of 2000 and two more in the third quarter of 2001. However, the factory had problems attaining either adequate run rates or quality. By July 2002, LG Philips expected it might cost another $15 million to $25 million to revise the equipment, modify product designs, and correct operating processes.[57]

Another example is Samtel. In April 2004 it announced a $22 million project to add 1.5 million units of CPT capacity at its Ghaziabad, India plant with a May 2005 start date.[58] Line status reports from various Defendants indicate the start date was delayed, with mass production finally commencing after mid-March 2006.[59] However, despite the planned capacity of 125 thousand

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[55] TAEC 30(b)(6) Deposition of Jay Alan Heinecke, 31 July 2012, at 249:13-17.

[56] See, e.g.,

- Toshiba's U.S. factory in Horseheads, NY, variously tried producing 27" CPTs, 17" CDTs and 19" tubes, and was unable to produce any of those products economically. Toshiba 30(b)(6) Deposition 31 July 2012, at 59:17-61:16.
- IRICO had problems with the varnish it used to hold its deflection yokes in place; the varnish was melting. This resulted in many CRT returns and IRICO had difficulties gaining sales thereafter. Chunghwa Picture Tubes, LTD, 23 June 2000, Visitation Report, Topic: TV Tube Market, CHU00029110 - CHU00029115, at 9114E.
- "The production lines at Huapu [a Philips plant in Nanjing, China] have not reached their nominal annual capacity of 4 m. tubes and are producing low quality tubes. As a result, Huapu's sales are far behind budget, while Huapu has too much B-grade products, too much inventory and is facing high product returns. Huapu's net income for 2002 is expected to end up at - 18.4 m. USD, washing out Huapu's entire equity. [para.] To tackle these issues, an extensive improvement plan is under preparation together with the new Plant Director, thereby addressing the inadequate equipment, product designs, operating processes and organizational competence. An investment in the range of 15 - 25 m. USD might be needed." L.G. Philips Displays Holding B.V., Undated, Minutes of the Supervisory Board Meeting of LG.Philips Displays Holding B.V., PHLP-CRT-002306 - PHLP-CRT-002481, at 2339.

[57] L.G. Philips Displays Holding B.V., Undated, Minutes of the Supervisory Board Meeting of LG.Philips Displays Holding B.V., PHLP-CRT-002306 - PHLP-CRT-002481, at 2339.

[58] LG Philips Displays, 27 July 2004, 40422+W_W_line--factory line summaries, LPD_00035873.

[59] See, e.g.,

- "Plan to start in '05" appears from Dec. 2004 to April 2005. LG Philips Displays, 20 December 2004, 04 12 CRT Line Status, LPD_00034786 and LG Philips Displays, 21 April 2005, 04-21-05 Worldwide prod lines - All LG Philips Displays, 21 April 2005, 04-21-05 Worldwide prod lines - All manufacturers, LPD_00042476.
- In June 2005, "Production start is delayed to 1Q2006." MT Picture Display, 04 July 2005, CRT Line Status Jun 05, MTPD-0575968.
- On March 15, 2006, "MP is not started yet". MT Picture Display, 02 April 2006, CRT Line Status Mar 06, MTPD-0468631.
- June 2006, "29F started in 1Q 06". MT Picture Display, 19 June 2006, CRT Line Status Jun 06, MTPD-0426099.

units per month (= 1.5 million per year), by August 2007 the line had a reported capacity of only 41.667 thousand units per month.[60]

As indicated by the technical problems faced by various manufacturers, technical knowledge about CRT manufacturing was not always available. If such knowledge were readily available, manufacturers would not have abandoned attempts to introduce new products.[61] As an example, when Irico was having technical problems, it first sought assistance from Toshiba, an investor in Irico at the time. When "Toshiba was not too enthusiastic in transferring technology", Irico sought help from Chunghwa.[62]

It is unclear how readily CRT plants can be used for purposes other than manufacturing CRTs. There is some testimony the plants have little other use.[63] However, it appears Chunghwa converted a CRT plant to produce plasma display panels after moving the CRT lines to a Chunghwa plant in China.[64]

CRT manufacturing equipment is not useful for anything other than manufacturing CRTs.[65] Some manufacturers tried to sell disused lines, without success.[66]

C. CRT industry structure

1. The cartel controlled most of CRT production and capacity

[60] [redacted]

[61] Here I refer specifically to products abandoned expressly due to technical inability to produce the product, as described earlier.

[62] Chunghwa Picture Tubes, LTD, 23 June 2000, Visitation Report, Topic: TV Tube Market, CHU00029110 - CHU00029115, at 9114E.

[63] See, e.g.,

- "Q. Do you know whether CRT production facilities can be used for manufacturing anything other than CRTs? A. Based on my understanding, that's not possible." Hitachi 30(b)(6) Deposition of Nobuhiko Kobayashi, 17 July 2012, at 93:7-11.
- MTPD's Ohio plant is now producing garage "shutters" [doors?]; their Indonesian plant was demolished after they shut it down. Panasonic 30(b)(6) Deposition of Tatsuo Tobinaga, 16 July 2012, at 147:9-149:8.

[64] "Since late 2000, in order to take advantage of lower labor costs in the China, the Company began moving two 15 inch CDT production lines and two 17 inch CDT production lines from Taoyuan, Taiwan to Chunghwa Picture Tubes (Fuzhou) Ltd., and replacing those production lines with PDP (plasma display Panel.)" Chunghwa Picture Tubes, LTD, 15 August 2002, Chunghwa Picture Tubes, Ltd. Financial Statements For The Three-Month Period Ended March 31, 2002 and 2001 With Report of Independent Auditors, CHU00000260 - CHU00000304, at 0278.

[65] See, e.g.,

- Hitachi 30(b)(6) Deposition of Nobuhiko Kobayashi, 17 July 2012, at 93:21-25.
- Prior to 2004, MTPD sometimes overhauled lines that were being shut down at one plant and installed them at a different plant. It decided "it wasn't possible to really create a very good facility doing it that way." Its attempts to sell disused lines were unsuccessful. After 2004 or 2005, it decided to scrap the CRT lines when it shut them down. Panasonic 30(b)(6) Deposition of Tatsuo Tobinaga, 16 July 2012, at 149:6-8.

[66] See, e.g., "…did you ever sell any equipment to third parties? A. We tried that, but it wasn't successful." Panasonic 30(b)(6) Deposition of Tatsuo Tobinaga, 16 July 2012, at 147:9-149:8.

As noted above, customers generally cannot substitute between CDTs and CPTs. Production shares for CDTs and CPTs show the cartel members controlled a very large share of production of each type of tube; see Exhibits 4 and 5, respectively.

The Herfindahl-Hirschman Index (HHI) is widely used in scholarly research as well as in antitrust legal and economic analyses to measure the degree of concentration in an industry.[67] The HHI is based on the distribution of market shares across firms. Lower HHI values indicate a less concentrated market, with many firms each having low market share, and hence, more competitive conditions for market participants. According to the 2010 Horizontal Merger Guidelines, the U.S. Department of Justice (DOJ) considers markets with HHIs below 1500 to be "unconcentrated", between 1500-2500 "moderately concentrated", and above 2500 "highly concentrated".[68] Production of each type of tube was highly concentrated with the cartel in place, with HHIs in excess of 8,000 for CDT production and 7,000 for CPT production. This is a dramatic contrast to the degree of concentration that would have existed absent the cartel. See Exhibits 6 and 7.

As noted above, some degree of supply substitution is possible: some lines were designed to be able to switch relatively quickly between CDT and CPT production and other lines were converted from producing one type of tube to the other. Therefore I also examined CRT manufacturing as a whole. With the cartel in place, CRT manufacturing was highly concentrated, with the HHI exceeding 7,800. Again, the concentration resulting from the cartel is in dramatic contrast to the concentration that would have existed absent the cartel. See Exhibit 8.

2. Falling demand and excess capacity cause sick industry problem

Falling demand and persistent excess capacity often cause the long-run decline of an industry. Noted antitrust scholars, Areeda, Hovenkamp, and Solow say:

> When demand for a product declines, competition drives price below full costs, including a competitive return on capital; producers will continue to earn less than a competitive return until the excess capacity is withdrawn… Barriers to mobility prolong and magnify the losses; competition may become "ruinous."… Until it wears out, plant or equipment will continue in operation so long as price exceeds variable costs, because some return on investment is better than nothing. Thus price can fall and remain well below full costs for an extended period before capacities are reduced enough to restore profitable operations.[69]

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[67] The Herfindahl-Hirschman Index (HHI) is calculated by summing the squares of the market shares of all participants in the relevant market. In the case of a pure monopoly, the Herfindahl takes the value of 10,000 (100 squared). In the case of perfect competition (in which no single firm has a large market share), the index will tend toward zero. The U.S. Department of Justice and Federal Trade Commission use Herfindahl indexes as one of the tools to assess competitive conditions. U.S. Department of Justice and Federal Trade Commission, 19 August 2010, 2010 Horizontal Merger Guidelines.

[68] Department of Justice and Federal Trade Commission, 18 August 2010, 2010 Horizontal Merger Guidelines, at Section 5.3 Market Concentration.

[69] Areeda, Philip E., Hovenkamp, Herbert, et al., 2007, Antitrust Law: An Analysis of Antitrust Principles and Their Application, Volume IIB, Third Edition, Aspen Publishers, at ¶413a.

Scherer and Ross, in a classic Industrial Organization textbook, call the phenomenon described by Areeda, Hovenkamp, and Solow the "sick industry problem", and state conditions necessary for the problem to arise:

> The cutthroat competition issue has two principal branches. One pertains to industries with chronic excess capacity because superior substitutes have appeared on the scene… the case of the secularly declining or "sick" industry. There are two chief prerequisites: capacity substantially in excess of current and probable future demands and rigidities that retard the reallocation of capital and/or labor toward growing industries. Then unless there is some artificial restraint such as … tightly knit cartel agreements, competition is likely to drive prices down to levels that yield investors much less than a normal return on their capital. …When firms' cost structures include a high proportion of fixed costs, this profitless existence can continue for years or even (as in railroading and coal mining) for decades, since producers find it preferable to continue operation and cover at least their … variable costs than to shut down.[70]

a) The CRT industry suffered from falling demand

LCD technology is a functional substitute for CRT technology, i.e., it performs a similar function for the end-user. LCD technology's primary benefit is to reduce the size and weight of a monitor or television. LCDs were not practical alternatives to CRTs until the early- to mid-2000s when LCD manufacturing costs fell significantly. Even then, LCD monitors and TVs were far more expensive than comparable CRT finished goods and as a result did not constrain the price that Defendants could charge for CRTs.[71]

However, the growing popularity of LCD technology, first for monitors and then TVs, did result in a shrinking market for CRTs. As a result, production capacity significantly exceeded demand for CRTs beginning by the early 2000s.

b) Excess production capacity existed throughout the damages period

Throughout the relevant period, CRT manufacturing capacity exceeded quantity demanded at the cartelized market prices for both CDTs and CPTs.

(1) There was excess CDT capacity

[70] Scherer, F.M. and David Ross, 1990, Industrial Market Structure and Economic Performance, Third Edition, Houghton Mifflin Company: Boston, at 294.

[71] If the availability of Product A limits the price at which suppliers can sell Product B, then Product A constrains the price of Product B. Two products may be functional substitutes – that is, they perform the same function – without constraining sellers' pricing decisions. For example, a Ferrari sports car and a Honda Civic are functional substitutes because they both provide automotive transportation. However, the price and performance characteristics of the two vehicles are so different that the availability of the Ferrari does not constrain the price that Honda can charge for a Civic and vice versa. The vehicles are not price constraining substitutes. See Section VIII.A.2.c) for a more detailed discussion of economic substitutes and market power.

Toshiba described CDT manufacturing as having "much excess" capacity and the ability to "easily increase" production in the late 1990s.[72] By Toshiba's calculations, capacity equaled output in 1995 and thereafter exceeded output by 19% in 1996, 31% in 1997, 37% in 1998, 35% in 1999, and 27% in 2000.[73]

In 2000-2001, the dot-com crash depressed computer sales.[74] Unit sales of all types of computer monitors declined 3% from 2000 to 2001.[75] To make matters worse for CDT manufacturers, consumer demand was shifting away from CRT monitors to LCD monitors: LCD monitors rose from 5% of units in 2000 to 15% in 2001. The shift to LCDs was occurring despite LCD monitor prices being four to five times the amount of CRT monitors of the same size.[76]

This double blow had a very significant impact on CDT manufacturing, with most vendors reporting very low utilization rates in 2001.[77] Matsushita and TECO halted production and Orion was "struggling for survival".[78]

CDT production never recovered. When monitor demand began growing again, LCD panels, not CDTs, benefited from the recovery. LCD monitors went from 15% of the market in 2001 to 28% in 2002 and captured half the market by 2004, again despite pricing that, by 2004, had LCD monitors at 2.5 times the price of CRT monitors of the same size.[79]

(2) There was excess CPT capacity

Total output of CPTs rose from the start of the relevant period until it peaked in 2004. However, from 2000 onward, the increase in CPT output was less than the decline in CDT output, with total output of CRTs never regaining the 2000 peak. See Exhibit 9.

As noted above, CDT capacity can be converted to produce CPTs. There was excess CDT capacity in 2000, which would only increase as CDT demand decreased.[80] Thus, the amount of CDT capacity becoming available for conversion to CPT production exceeded any growth in

[72] "But CDT capacity is much excess (135% in 99) vs CDT demand ==>> CDT supply can be easily increased, if necessary." Toshiba America Electronic Components, Inc., 21 July 1999, CDT & Monitor Demand Supply Analysis, TAEC-CRT-00065484, at Tab 'topics', K6:K7.

[73] See Toshiba America Electronic Components, Inc., 21 July 1999, CDT & Monitor Demand Supply Analysis, TAEC-CRT-00065484, Tab 'MNTR VS CDT (2)', row 92 and Toshiba Electronics Taiwan, 24 April 2001, CDT & Monitor Demand Supply Analysis, TET-CRT-00003403, at Tab 'Deman&Supply graph', row 37.

[74] PC shipment data show unit sales in the 2nd quarter 2001 had fallen below prior year sales. The data also indicate full-year 2001 PC shipments were expected to be about 6% lower than 2000. Toshiba America Electronics Components, 2001, PC Shipments by Quarter, 1994-2002, TAEC-CRT-00018123.

[75] DisplaySearch, May 2011, Analysis Group, Inc. Custom Data Project, DISP_LCD_000128.

[76] DisplaySearch, May 2011, Analysis Group, Inc. Custom Data Project, DISP_LCD_000128.

[77] SDI had "the best loading in the industry (~75%)", Chunghwa was at 60%, Philips at 60%-65%, LG at 55%-60%, HTC at less than 40%, Toshiba at 60%, Sony at 50%, and Mitsubishi at 58%. Baran, Milan, 08 May 2001, E-mail, Subject: CDT Price Guideline for May 2001, PHLP-CRT-026590, at 6591-6592.

[78] Baran, Milan, 08 May 2001, E-mail, Subject: CDT Price Guideline for May 2001, PHLP-CRT-026590, at 6591 - 6592.

[79] DisplaySearch, May 2011, Analysis Group, Inc. Custom Data Project, DISP_LCD_000128.

[80] As noted above, CRT production equipment has no value in other uses and, with CPT production continuing, the plants themselves needed to be retained. This means idled CDT capacity would grow as demand declined.

CPT demand from 2000 onward. In 2000, CPT manufacturers' available capacity, "without overtime", was 16% greater than their production and the gap was expected to increase to 19% for the full year 2001.[81] As noted above, CDT manufacturers had 27% excess capacity in 2000. With excess capacity in both CPT and CDT in 2000, and declining total CRT demand thereafter, excess capacity among incumbents must have grown after 2000. Because CRT production facilities and equipment are not readily used for other purposes, the excess capacity problem looked likely to persist.

c) Cartel members recognized their industry was in secular decline and, but for the cartel, would have engaged in "ruinous" competition

The CRT industry satisfied the two conditions – secular decline in demand and excess capacity – necessary for the "sick industry problem". Statements from industry participants match economists' predictions for firms in a sick industry: they would have been willing to price below average total costs, ignoring their cost of capital (as reflected in accountant's depreciation):

> "…current management strategy is to balance actual revenue and expenditure. In other words, whether there is a loss on the books would not be the standard. For example, depreciation is just a book term and has no impact on actual cash losses or actual revenue and expenditure."[82]

> "As you know, Thomson has announced write-off of assets for their Mexicali factory a few weeks ago. As a result, their cost structure is similar to [LPD's Gomez Palacio CRT plant in Mexico] (no depreciation expense)."[83]

The industry participants also recognized that the solution to a decline in demand and excess capacity was cooperation and coordination, absent which ruinous competition would occur:

> "Price erosion is only indirectly driven by LCD penetration but rather by head on competition among the remaining CDT producers"[84]

> "Also, the CRT TV market will not be able to prevent an LCD invasion, so expect CRT market demand to continuously decrease. Cooperation within the industry is critical and is a survival issue. If there is proper cooperation within the industry during the first half of the year, there should not be an inventory issue and we may prevent loss due to a price drop. Therefore cooperation is important even during the off-season next year."[85]

D. Some cartel members were vertically integrated[86]

[81] Chunghwa Picture Tubes, LTD, October 2001, LINE Status by Maker, CHU00125296.

[82] This is the view of Thai-CRT, as reported in notes from a cartel meeting. CPT, February 2003, Comprehensive Report Regarding Marketing Contacts, CHU00030080 - CHU00030081, at 0080.02E.

[83] Canavan, Pat, 15 November 2004, E-mail, Subject: Re: 29RF global pricing status, PHLP-CRT-023911 - PHLP-CRT-023915, at 3914.

[84] LG Philips Displays, 02 December 2003, LG.Philips Displays to restructure its European industrial production infrastructure, PHLP-CRT-001323 - PHLP-CRT-001556, at 1487.

[85] Samsung SDI, August 2005, Competitor China Visit Report, SDCRT-0091524 - SDCRT-0091530, at 1528E.

[86] See Appendix A of my Class Certification report for evidence underlying this section.

Many CRT manufacturers were vertically integrated into downstream production, manufacturing finished goods incorporating CRTs as well as CRTs themselves. For example, cartel members Hitachi, LGE, Panasonic/Matsushita, Philips, Samsung, Thomson, and Toshiba are familiar brand names for computer monitors and televisions. Outside the cartel, Sony is another CRT manufacturer that is a familiar brand name, vertically integrated into finished product manufacturing. When the two big CRT joint ventures, LG Philips and MTPD, were formed, neither entity included the parent firms' finished product divisions, but these CRT joint ventures continued to supply the parent firms' finished product divisions.

E. Distribution of CRT monitors and TVs

CRTs travel from Defendants to class members through a distribution chain which generally includes the following levels:

- CRT manufacturers sell tubes to product manufacturers (sometimes via a distributor).
- CRT product manufacturers sell CRT monitors and TVs to retailers (sometimes via a distributor).[87]
- Retailers sell the CRT products to class members.

The distribution system is largely the same for both CRT monitors and CRT TVs. For a graphical depiction of the distribution system, see Exhibit 10.

1. Direct purchasers

CRT manufacturers sell to two types of direct purchasers: CRT distributors (firms that distribute CRTs to other firms that incorporate the CRTs into CRT products) and product manufacturers (firms that incorporate CRTs into CRT products).

a) CRT distributors

Distributors buy and sell large quantities of CRTs. Several CRT manufacturers distribute CRTs via affiliated distributors. For example, TAEC is a Toshiba subsidiary that functions as a distributor of Toshiba tubes in North America; LG Philips Displays USA distributed tubes for LPD; and Samsung SDI America distributed tubes for Samsung.[88] Other Defendants also have

[87] Some product manufacturers, such as Dell, also sell directly to class members.

[88] See, e.g.,

- Toshiba America, Inc. (TAI) is the 100 percent shareholder for Toshiba American Electronic Components (TAEC) and Toshiba Corporation in Japan owns 100 percent of TAI. TAEC 30(b)(6) Deposition of Jay Alan Heinecke, 31 July 2012, at 158.
- TAEC testified that its role was to distribute Toshiba panels to customers in North America: "Q. Okay. If the CDT was coming to North America however, you would take title; TAEC would take title? A. If the – if their – yes. If it came into North America, TAEC was the sales arm to the monitor assembler." TAEC 30(b)(6) Deposition of Jay Alan Heinecke, 31 July 2012, at 143:4-143:8.
- LG.Philips Displays USA was LPD's U.S. distributor. A.A.M. Deterink, 28 August 2006, Trustee's Second Report in the bankruptcies of LG.Philips Displays Holding B.V. and LG.Philips Displays Netherlands B.V. and LG.Philips Displays Investment B.V., http://deterinklive.com/nl/publicaties/faillissementsverslagen/l/, accessed 12 July 2012, at 28.

affiliated companies that act as CRT distributors. It appears that there were very limited, if any, sales of CRTs to third party distributors.

b) CRT product manufacturers

Product manufacturers obtain inputs, including CRTs, and assemble them into computer monitors and TVs. During the manufacturing process, the CRT itself is not modified, but is combined with other inputs to assemble the monitor or TV. Product manufacturers operate under a variety of business models; however, these firms perform the same basic function—they manufacture monitors and TVs using CRTs. Below are descriptions of the various business models employed by product manufacturers.

- Original Equipment Manufacturers (OEMs) sell finished products under their own brand name. An OEM may be responsible for all the design and manufacturing of the finished CRT product, but also may contract some, or even all, engineering and manufacturing to contract manufacturers (CMs).[89]
- Contract Manufacturers (CM) make components or finished CRT products for other suppliers of CRT products; these products are sold under the name of the customer ordering the product. There are two types of CRT contract manufacturers, Electronics Manufacturing Services (EMSs) and Original Design Manufacturers (ODMs).
  - EMS providers manufacture components and CRT products for their customers, but do not own the IP for the product or its design. EMSs may also provide additional services such as product design or supply chain management.[90]

- Samsung SDI America is Samsung's U.S. sales corporation for CPTs. Samsung, 2001, Consolidated Balance Sheets, SDCRT-0000039 - SDCRT-0000081, at 0050.

[89] Even if assembly of the CRT product is carried out by a CM, the OEM may still negotiate directly with the CRT manufacturers for the terms and conditions on which CRTs will be delivered to the CMs. See, e.g., "Our component sourcing and product development staff researches, develops and tests the latest display technologies with our component suppliers and contract manufacturers, and is charged with designing and developing the highest quality display products at selected price points. We have established relationships with multiple sources of display components and multiple display manufacturers, and qualify additional component suppliers and contract manufacturers when advantageous to us. We currently obtain display components from multiple suppliers, including Hitachi, Intel, LG-Philips, Samsung, Quanta and Chi-Mei." Viewsonic Corporation, 29 March 2005, Viewsonic Corporation 10-K 2004, http://www.SEC.gov/Archives/edgar/data/1068806/000101540205001539/form10k_123104.htm, accessed 17 March 2014, at 4.

[90] See, e.g.,

- Sitronics, a European electronics company, defines Electronics Manufacturing Services (EMS) companies as "[a] company that provides design, testing, manufacturing, distribution and return/repair services for electronic components and assemblies for original equipment manufacturers." Sitronics, Undated, Glossary, http://www.sitronics.com/investors/glossary/, accessed 17 March 2014, at 3.
- "The EMS provider is usually engaged in a number of product verticals and offers diverse operation-oriented services ranging from PCB assembly, box assembly, sub-unit assembly to logistics. And the EMS provider has multiple facilities in the world serving different purposes and clients." 10 November 2005, An Interview with iSuppli's Jeffrey Wu - ODM vs EMS, what happens next?, EMSNow, http://www.emsnow.com/npps/story.cfm?ID=15416, accessed 18 June 2008, at 1.

- ODMs design and manufacture CRT products to be sold under their customers' brand name.[91] Unlike an EMS, an ODM generally owns or licenses the IP for the product and its design,[92] but in some cases, ODMs design products according to customer specifications.[93] ODMs also may perform all of the design work, offering products that are customized only by adding the customer's brand name prior to sale.[94] ODMs may manufacture products that are sold under many different brand names.[95] In addition, some ODMs may also market products under their own brand name.[96] ODMs may ship finished products directly to distributors or retailers, bypassing the OEM whose name appears on the product.[97]

- Systems Integrators (SIs) operate very similarly to OEMs, but differ in that they make unbranded or "white-box" computer systems, including monitors.[98] It does not appear that SIs or systems builders make TVs.

2. Indirect purchasers

- [91] ". . .an ODM is a company that manufactures products of its own designs, which are then sold under an OEM's brand name." Weber, Austin, 01 February 2003, Outsourcing's Alphabet Soup, Assembly Magazine, http://www.assemblymag.com/copyright/9411390b7d5c9010VgnVCM100000f932a8c0____?view=print, accessed 18 June 2008, at 1.

- [92] "An ODM performs all the functions traditionally associated with EMS firms, in addition to actually designing products based on their own intellectual property." Weber, Austin, 01 February 2003, Outsourcing's Alphabet Soup, Assembly Magazine, http://www.assemblymag.com/copyright/9411390b7d5c9010VgnVCM100000f932a8c0____?view=print, accessed 18 June 2008, at 1.

- [93] "In the 'Design It' strategy, the OEM involves the ODM in the product design stage to different degrees, depending on the OEM's resource constraints and long-term R&D planning." 10 November 2005, An Interview with iSuppli's Jeffery Wu - ODM vs EMS, what happens next?, EMSNow, http://www.emsnow.com/npps/story.cfm?ID=15416, accessed 18 June 2008, at 1.

[94] "Now the outsourcing decision is getting complex because of growing demand for original design manufacturers (ODMs). ODMs not only build a product, but also design it for an OEM. The ODM owns the intellectual property or they license it." Carbone, Jim, 16 January 2003, ODMs offer design expertise; quicker time to market, http://www.purchasing.com/index.ASP?layout=articlePrint&articleID=CA269147&article_prefix=CA&article_id=269147, accessed 01 February 2008, at 1.

[95] "In many cases, the ODM will design and build products, such as VCRs or televisions, and sell the products to multiple OEMs. The OEMs then market the products under their own brand names." Carbone, Jim, 16 January 2003, ODMs offer design expertise, quicker time to market, Purchasing, http://www.purchasing.com/index.asp?layout=articlePrint&articleID=CA269147&article_prefix=CA&article_id=269147, accessed 01 January 2008, at 1.

[96] BenQ, a CRT finished product manufacturer, employs both the ODM and OEM business model. 10 November 2005, An Interview with iSuppli's Jeffery Wu - ODM vs EMS, what happens next?, EMSNow, http://www.emsnow.com/npps/story.cfm?ID=15416, accessed 18 June 2008, at 1.

[97] The distinction between ODMs and EMSs is diminishing as EMS providers acquire design capability. However, ODMs tend to specialize in only a few products where EMSs are usually engaged in a number of vertical product markets. 10 November 2005, An Interview with iSuppli's Jeffery Wu - ODM vs. EMS, what happens next?, EMSNow, http://www.emsnow.com/npps/story.cfm?ID=15416, accessed 18 June 2008, at 1.

[98] 31 March 2014, White box (computer hardware), Wikipedia, http://en.wikipedia.org/wiki/White_box_(computer_hardware), accessed 31 March 2014.

Product manufacturers sell CRT products either directly to retailers or to distributors that subsequently resell the CRT products to retailers. These retailers and distributors are indirect purchasers of CRT products; that is, they are not purchasing directly from the CRT manufacturers.

a) Product distributors

Finished CRT products can be shipped to retail markets through independent distributors. These distributors are responsible for maintaining product inventory and preparing it for shipment. Distributors usually ship products to retailers that, in turn, resell to end customers; however, distributors sometimes drop-ship products directly to end customers who purchase through a retailer.[99]

b) Retailers

Retailers sell finished CRT products to end consumers. These retailers include "big box" electronics retailers, specialty retailers, on-line merchants, and direct sales from OEMs to consumers. There are two general types of retail stores: brick-and-mortar stores (e.g., Best Buy, Radio Shack, Staples, Circuit City, Target, and Wal-Mart) and online retailers (e.g., Amazon.com, Buy.com, Dell.com, hp.com, Newegg, PC Mall).[100]

3. Final consumers (class members)

End-customers purchase CRT products for their own use and do not resell them. End-customers are indirect purchasers that typically purchase CRT monitors and TVs from retailers; however, in some circumstances they purchase CRT products directly from product manufacturers. In the latter scenario, end-customers are still indirect purchasers of CRTs since the product manufacturer is the entity that purchases CRTs and resells CRT products to the end-customers.

VII. The economics of cartels

I discussed the basic economics of cartels in my expert report in support of class certification.[101] For convenience, I have included that discussion as Appendix 1 of this report. There are four important points that are relevant to the economic analysis of whether the CRT cartel caused antitrust injury:

- A successful or effective cartel raises prices above the level they would have been but for the collusive conduct. I call the price that would have prevailed absent the cartel the

[99] Klein, Karen E., 22 September 2009, How Drop-Shipping Works for Retailers and Manufacturers - Businessweek, Bloomberg Businessweek, http://www.businessweek.com/smallbiz/content/sep2009/sb20090922_341780.htm, accessed 28 March 2014.

[100] Generally, brick-and-mortar stores also sell some products online, while online retailers typically sell online exclusively.

[101] Netz, Janet S., 01 October 2012, Declaration of Janet S. Netz, Ph.D., In Support of Motion of Indirect-Purchaser Plaintiffs For Class Certification, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Netz Class Cert Report").

"competitive price"[102] or the "but-for price". A successful cartel, as I use the term, necessarily causes antitrust harm.

- Prices can be above the competitive level even if prices are falling over time. That is, falling prices do not indicate a lack of antitrust harm. The appropriate comparison for examining the success of a cartel is the actual cartel price compared to the but-for price, not the actual cartel price in one period compared to the next.[103]
- Cartel success is a matter of degree. A perfect cartel would set the monopoly price, which maximizes the joint profits the cartel members can earn as a cartel. However, a cartel can be successful even if it fails to raise prices to the monopoly level, as long as cartel prices are above the competitive level. Thus, the observation of some degree of cartel members "cheating" by charging customers lower prices and producing more than agreed is consistent with a successful cartel.[104]
- A cartel can be successful even if some members are vertically integrated downstream and others are not. Both vertically integrated and unintegrated cartel members profit from an upstream cartel. A vertically integrated cartel member profits from the higher prices for intermediate goods sold to unrelated firms and from the higher prices for finished goods produced by its downstream subsidiary that result from the higher prices charged to unrelated firms. An unintegrated cartel member profits only via the first mechanism.

VIII. The CRT cartel caused class members to pay higher prices

Based on the analyses described below, I conclude that the cartel increased prices to direct purchasers and that the overcharge was passed through to class members.

A. The cartel increased prices to direct purchasers

In this section, I describe the economic analysis I undertook to determine whether the cartel increased prices to direct customers. I start by considering the cartel's statements and actions; both support my conclusion that the cartel did increase prices. I then examine the cartel's market power and various industry characteristics that might, but don't, eliminate the cartel's market power or its ability to exercise its market power. I then evaluate the cartel's practices and their impact on prices. Finally I engage in an econometric analysis that directly shows higher prices resulting from the cartel's actions.

All of this evidence and analyses support my conclusion that the cartel caused the prices to direct purchasers to be above the competitive level.

[102] The "competitive price" is not to be confused with the equilibrium price in a perfectly competitive market. Most markets are not perfectly competitive even if free of monopolizing conduct such as cartelization; the "competitive price" is therefore not, in general, equal to the equilibrium price in a perfectly competitive market. Rather, it is the price that would prevail if cartel members competed freely with each other rather than colluding.

[103] Actual prices in time periods outside the cartel can be used to estimate the but-for price, which can then be compared to the actual price charged during the cartel.

[104] Bernheim, B. Douglas and Erik Madson, March 2014, Price Cutting and Business Stealing in Imperfect Cartels, NBER Working Paper Series 19993.

1. The cartel's success is demonstrated by the statements and conduct of cartel members

a) Cartel members reported they could and did raise prices

Cartel members were well-placed to know whether the cartel's efforts to set prices above the competitive level were successful. In contemporaneous business documents, including notes from cartel meetings, cartel members repeatedly declared their ability and intent to raise and maintain the prices of CPTs[105] and CDTs[106] above the competitive level.[107] Cartel members also regularly reported their success in raising or maintaining prices[108] for CPTs[109] and CDTs.[110]

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[105] See, e.g.,

- From meeting notes: "Suggestion to Top Management 1. Every CPT maker's situation is getting improved in 14"/20"/21" together. Even with limited information of today, we can forecast the balance situation of supply and demand from June and July. And glass bulb price was increased from 2Q. 2. So, we believe that price can be increased from 3Q. 3. But, TV & DSP [display or monitor] market are quite different, the action must be taken very carefully. So we would like to suggest Guideline of price and timing expected be decided on the meeting of Apr. 15. Finally, CPT maker need to have a meeting to discuss detailed action plan to increase the price from 3Q in the beginning of May." Chunghwa Picture Tubes, LTD, 09 April 1999, Visitation Report, Subject: 14", 20", 21" CPT Respective Makers' Recent Status and Price Opinion Review, CHU00028606 - CHU00028608, at 8608.01E.
- From meeting notes: "With makers' changing lines, a shortage is likely to happen. As long as everybody cooperates, a price rise adjustment would definitely be successful." Du, Ching-Yuan (Michael), Hsieh, et al., 01 June 1999, CPT Sales Department Business Meeting Report, CHU00029189 - CHU00029190, at 9189E.
- From meeting notes: "For the price rise this time, although customers have not confirmed acceptance, SDI [Samsung] Mr. Park claimed that SDI has discussed the new price with almost all customers, and felt that the customers were not as resistant to price increases as last time. Thus, he thinks that the price increase this time should be easier than last time. In addition, OEC [Orion] Mr. Lee also claimed that Funai had no particular comment on the price increase. So OEC also thinks that the price can be raised smoothly and successfully." Chunghwa Picture Tubes, LTD, 24 March 2000, Visitation Report, Topic: Market Information Exchange and Price Review, CHU00029144 - CHU00029146, at 9146.02E.
- From meeting notes: "The supply and demand in the market of 20"/21"/21"F tubes next year are more heated than this year and the price raise in the European Market should be successful." Chunghwa Picture Tubes, LTD, 25 October 2000, Visit Report, Topic: Exchange of CPT market information and review of price, supply and demand, CHU00028975 - CHU00028976, at 8976.02E.

[106] See, e.g.,

- From meeting notes: "Directory [sic] Liu again patiently explained about the price raise background/ current price of various CRT makers/ situation of monitor makers/ HTC [Hitachi] 14" and 15" are no long [sic] the main stream and in April, HTC has raised the price slightly by USD 1-2.00 as well as other points of suspicion. This was to let him understand that there was already certain degree of success in following of price rise. There should not be any pressure from the customers. Furthermore, this was beneficial to his company's operation/ as well as to the overall industry." CPT, Liu, Chih-Chun (C.C.), et al., 23 April 1997, Visitation Report, CHU00028503 - CHU00028504, at 8504E.
- Manager Jian-Lung Zhang from Hitachi "indicated that he welcomes the price increase. He personally believes that if there can be another increase in October, HTC would follow." Chunghwa Picture Tubes, LTD, 21 August 1998, Sales Department Customer Contact Report, CHU00028385 - CHU00028387, at 2386E
- From meeting notes: "SDI [Samsung] also brought up that there should be a price increase for the 14" CDT because its demand exceeds its supply. Employee replied that it must be decided and passed through the

headquarter GLASS MEETING. There is optimism for success." Chunghwa Picture Tubes, LTD, 06 April 2000, CPTF [Chunghwa Picture Tubes Fuzhou] Sales Department Visitation Report, Meeting Main Topic: China CDT Market Exchange, CHU00030992 - CHU00030994, at 0993.01E.

- From meeting notes: "Manager Chang claims that regarding China and Korea maker's 14"/15"/17" CDT price increase, HTC [Hitachi] itself also intends to increase. Its headquarters' resolution is that if prices have definitely increased, HTC guarantees that it would FLW." CPT [Chunghwa], Du, Ching-Yuan (Michael), et al., 16 June 2000, Contact Report, CHU00028377, at 8378E.

[107] See, e.g.,

- Chih Chun-Liu, VP of sales at Chunghwa from 2000 to 2005, testified on the cartel's success. "Q. Do you agree, Mr. Liu, that in times of over-supply these group competitor meetings helped keep prices from falling as much as they would have? [objections omitted] THE WITNESS: Agree. BY MS. BERNSTEIN: Q. And when there was a shortage of tubes, sir, do you agree that these group competitor meetings allowed suppliers to raise prices faster? [objections omitted] THE WITNESS: Agreed." 20 February 2013, Deposition of Chih Chun-Liu, Volume II, at 364:19 - 365:10.

- A 1999 review of the working-level cartel meetings stated that "because of the success of the Glass Meeting, everybody has been Enjoying Business [sic] this year" and called for continued cooperation. "Review of the implementation method of the Working Level weekly meeting: Each maker indicated that because of the success of Glass Meeting, everybody has been Enjoying Business this year. Now that the Slow Season is coming, everybody should continue to strengthen communications and contacts, so the weekly meetings should continue to be held on time." Chunghwa Picture Tubes, LTD, 09 November 1999, Visitation Report, CHU00030916 - CHU00030918, at 0916.02E.

[108] Recall that when prices are generally declining, a cartel may collude in order to maintain constant prices, which are above competitive prices. See Section VII and Appendix 1.

[109] See, e.g.,

- Meeting notes referring to LPD's 14" CPT price increase: "An increase of $0.5 ($18.5/April -) was obtained." Nishimura, Tanaha, 22 March 2004, Letter, Discard immediately after reading / Do not save to PC / Forwarding prohibited, MTPD-0419572 - MTPD-0419573, at 9572E.

- From CPT meeting notes: "SDD [Samsung] said that BMCC [Matsushita] has raised its original Bare Tube sales price of USD 29.5 for MTV to USD 30.5 following communications with SDD." Chunghwa Picture Tubes, LTD, 23 August 1999, Visitation Report (Submit), CHU00029179 - CHU00029184, at 9179.02E.

- From Chunghwa's notes from a meeting with Matsushita Electronic Corporation (Malaysia): "He explained fully the situation of current price increase. Price of 20" was also successfully raised by $1-$2. Furthermore now all 20" supplying makers were all very tight (other than SDEM [Samsung Electron Devices (Malaysia)] which was slightly loose), Matsushita should be able to adjust its prices in good time. Mr. Tomori indicated that internally there was already a plan and would negotiate with customers shortly. It would start raising 20" price in October." Chunghwa Picture Tubes (Malaysia), Yang, Sheng-Jen (S.J.), 07 September 1999, CPT Sales & Marketing Division Visiting Report, CHU00028438, at 8438.02E.

- "As far as the 14"/20" tube price increases are concerned, other than Thai-CRT not attending the meeting, so Thai-CRT's 20" price for July TCE/Funai is yet to be confirmed, all attendees believe that the price increase has been a full success. Mr. Chairman expressed gratitude for everyone's cooperation and hard work." Chunghwa Picture Tubes, LTD, 13 July 2000, Visitation Report, Topic: Market Information Exchange and Price Review, CHU00029108 - CHU00029109, at 9109E.

- From June 2000 meeting notes: "CPT Tube: Director Liu explained that after China and Korea makers communicated with and explained the market status to related makers individually, of the China makers who were originally exporting the 21" tube with low prices, PH Nanjing has already increased $0.5/pcs in May. It plans to adjust another $12/pcs in August. HTC Shenzhen also agreed to increase the current price of Bare $48-$49/pcs, to $51/pcs in August. The price increase of 20" tubes in Southeast Asia is also very successful. Customers such as Funai/TCE/AIWA/JVC, etc. have all accepted new prices of $49/pcs or

b) Cartel members reported they could and did restrict output and capacity to raise price

A cartel possesses market power if it can raise price by restricting the output of its members relative to what members would have produced if there were no cartel.[111] The cartel meeting

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more. Prices for medium and small-size customers such as Silver are at $50/pcs. [Break] Mr. Matsumoto thanked CPT for its explanation and promised to take action to announce the price increase of 20"/21" tubes to customers." CPT, Liu, et al., 21 June 2000, Visitation Report (Submit), CHU00028424, at 8424.01E - 8424.02E.

[110] See, e.g.,

- "CPTM [Chunghwa Malaysia] explained the price increase actions of CPT Group [Chunghwa Group]. The price increase for CDT (0.39/0.28) was implemented in the middle of May with a US$7.00 increase; moreover, all customers have accepted. The price for CPT will be increased starting on June 1 with a range of 14" -US$3.00, 20"/21"-US$4.00. Although it was difficult to raise the price, due to the tube shortage, the major customers accepted anyway." Chunghwa Picture Tubes, LTD, 29 May 1995, CPT Sales & Marketing Division Visiting Report, CHU00028933 - CHU00028945, at 8934E.
- A "market update" from a 1998 meeting stated that the 15" CDT "price increase is successful, some noises from M.N [I believe this refers to "Mainland" (as in Mainland China)] & Korean customers but manageable". Samsung, 01 August 1998, SDCRT-0086256, SDCRT-0086256 - SDCRT-0087004, at 6685.
- From Customer Contact Report: "After CPT [Chunghwa] and Korea Maker increased the 15" CDT selling price in August, there is no longer any price difference." CPT, Lui, et al., 20 August 1998, Sales Department Customer Contact Report, CHU00028248 - CHU00028249, at 8248E - 8249E.
- Meeting notes referring to CDTs: "Visited HTC/MEC/TSB [Hitachi/Matsushita/Toshiba] and other Taipei branch office personnel, expressed to them the successful price increase." Chunghwa Picture Tubes, LTD, 28 August 1998, Report (submit), CHU00023392 - CHU00023398, at 3394.01E.
- From meeting notes: "Chunghwa: Increased the price of "17 [sic]". Samsung SDI, 04 November 1998, SDCRT-0086441, SDCRT-0086441 - SDCRT-0086442, at 6441E.
- A meeting note referring to a previously planned price increase for 17" CDT stated, "All of the companies successfully increased their prices." Samsung SDI, 18 January 1999, CDT Industry (January 18, '99) Meeting Result, SDCRT-0086557 - SDCRT-0086560, at 6557E.
- Meeting participants reporting on the sales and prices of different sized CDTs: "SDD - Mr. D Y Kim said 1 [circled] Price of 14" [Underlined by hand] in China Mainland has been successfully raised to $50 [Underlined by hand]; ensuing customer demands are still strong." Chunghwa Picture Tubes, LTD, 23 June 1999, Business Meeting Report, CHU00030787 - CHU00030794, at 0787.02E.
- From meeting notes: "[T]he price of [15"] CDT's increased" and "14" [Bullet] Price increase completed". Samsung Display Device, Philips, 20 August 1999, Top Management Meeting (August 20), SDCRT-0086675 - SDCRT-0086681, at 6677E.
- Meeting notes from 1999 indicated that cartel members successfully raised prices for 14" and 15" CDTs. "In September, the price of 14" was successfully increased … All makers expressed that the current production and sales volume [for 15" CDTs] are still good and the prices in August had been successfully increased in accordance with the Agreed Price." Chunghwa Picture Tubes, LTD, 20 September 1999, Visitation Report (Submit), CHU00030855 - CHU00030868, at 0855.02E.
- "*Mr. Lin* emphasized that this year the 17" price has been able to be *keep* at a price no less than $90 because of the *Glass Meeting*." Chunghwa Picture Tubes, LTD, 13 October 1999, Contact Report, Meeting Topic: CDT Regular Exchange Meeting, CHU00030888 - CHU00030893, at 0889.

[111] "Market power is the ability to raise price profitably by restricting output." Areeda, Philip E., Hovenkamp, Herbert, et al., 2007, Antitrust Law: An Analysis of Antitrust Principles and Their Application, Volume IIB, Third

notes show the cartel was fully aware of the relationship between decreased output and increased price, with cartel members proclaiming they had successfully increased prices of both CDTs[112] and CPTs[113] by reducing capacity and cutting production. Cartel members reported their success in shutting down lines, both temporarily and permanently.[114]

Edition, Aspen Publishers, at ¶501. "Restricting output" means that the cartel held output below the competitive or but-for level; it does not necessarily mean that output decreases over time.

[112] For example, on the CDT side, notes from a October 13, 1999 meeting read: "In order to contribute to the stabilizing of the market price, CPT [Chunghwa] has decreased production of 17" to the utmost degree for quite a long time…Mr. Lin emphasized that this year the 17" price has been able to be keep [sic] at a price no less than $90 because of the Glass Meeting." Hsieh, Chun-Mei (Christina), 13 October 1999, Contact Report, Meeting Topic: CDT Regular Exchange Meeting, CHU00030888 - CHU00030893, at 0888.02E-0889.01E. For context, see,

- Notes from a April 14, 1999 meeting: "The price of the 17" CDT which was increased per agreement starting in May will be raised again (around July) after observing the situation…The companies agreed to stop producing 17" CDT's for at least 5 days (25 days of operation)." Samsung SDI, 19 April 1999, Report on the April 14 Management Meeting Results, SDCRT-0086593 - SDCRT-0086596, at 6593E.
- Notes from a May 21, 1999 meeting: "[Bullet] Up to now, the capacity adjustment for 17" CDT's has been proceeding smoothly as a result of cooperation among the companies. [Bullet] In June, 17" CDT production will stop for 5 days (25 operating days) to adjust the actual production volume in order to maintain the price level." Samsung SDI, May 1999, Report on the CDT management meeting results (May of '99), SDCRT-0086632 - SDCRT-0086633, at 6632E.
- Notes from a July 23, 1999 meeting, "Senior Manager Cheng proposed that the production stoppage period for 17" tubes be at least seven days in August in order to effectively ensure price levels." Chunghwa Picture Tubes and LTD, 23 July 1999, Visitation Report, Topic: CDT Market Information Exchange and Price/Production Volume Review, CHU00030809 - CHU00030814, at 0810.01E - 0810.02E.

[113] On the CPT side, notes from an October 27, 1999 meeting read: "Price-up trend [of small and medium CPTs] in European & American market thanks to capacity reduction in Asia." Chunghwa Picture Tubes and LTD, 27 October 1999, Visitation Report, Topic: Exchange of Market Information and Price Review, CHU00030899 - CHU00030903, at 0902E. For context, see:

- Notes from a 26 September 1998 meeting, "In order to stabilize price for this over-supplied market, a simulated adjustment of each maker's Q4 [1998] production volume plan is as follows." The notes then detail the quantity reductions of 14" and 20"/21" CPTs for each maker. Chunghwa Picture Tubes and LTD, 26 September 1998, Visitation Report, Topic: 14"/20"/21" CPT Supply/Demand and Price Comment Review, CHU00029262 - CHU00029264, at 9264.01E.
- Notes from a 20 May 1999 meeting describe the number of production lines reduced by each maker for 14" and medium-sized CPTs in Q1 1999. Supply and demand forecasts show overcapacity declining as the year progresses. Chunghwa Picture Tubes and LTD, 20 May 1999, Meeting Minutes, Meeting Subject: CPT Top Management Meeting, CHU00029191 - CHU00029194, at 9193E.

[114] See, e.g.,

- Meeting notes referring to output restriction at LPD said, "Production capacity's reduction was still progressing according to plan; UK and one production line of Huafei were closed down in 1Q and 2Q respectively." Chunghwa Picture Tubes, LTD, Undated, Review of CDT Market, CHU00660200 - CHU00660201, at 0200E.
- "Up to now, everybody has been quite cooperative regarding the implementation of reducing working days." Chunghwa Picture Tubes, LTD, 24 February 1997, Customer Contact Report, Contents Exchange of Opinions Regarding 14" CDT Price, CHU00028763 - CHU00028767, at 8763.01E.

c) Defendants' conduct makes no sense if the cartel was unable to raise prices above the competitive level

The CRT cartel members engaged in costly conduct for over twelve years, committing significant time and resources – conducting regular meetings, monitoring other members' output, and generating and sharing market intelligence all cost money, employees' time, and other corporate resources – to raising prices. In addition to these tangible costs, by participating in an illegal price-fixing scheme, cartel members bore a great deal of risk in the form of potential fines, legal liability, and jail-time for executives if the conspiracy were made public.

If, as is reasonable, one believes that the cartel members and their employees acted rationally, then they would not have engaged in such costly conduct unless the costs were outweighed by the increased profits cartel members accrued as a result of the cartel.[115] Absent the conspiracy to raise prices, cartel members would have avoided the costs and risks of the conspiracy entirely. If, despite their best efforts, cartel members had failed to raise prices and therefore profits, then they should have walked away from the conspiracy. The fact that Defendants, led by experienced

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- "Up to now, the capacity adjustment [reductions] for 17" CDT's has been proceeding smoothly as a result of cooperation among the companies." Samsung SDI, May 1999, Report on the CDT management meeting results (May of '99), SDCRT-0086632 - SDCRT-0086633, at 6632E.
- "[Heading] 17" Production Control [text] a) Mr. Jerry commented that various makers have coordinated very well on 17" Capacity control in the past three months. In view of the market situation, July's number of non-workdays should be higher than the average number over the April-June period, to demonstrate each maker's commitment to safeguarding the price." Chunghwa Picture Tubes, LTD, 23 June 1999, Business Meeting Report, CHU00030787 - CHU00030794, at 0791.02E.
- "Price up trend in European & American market thanks to capacity reduction in Asia." When asked about this quote, Chih Chun-Liu, VP of Sales at Chunghwa, testified that this is an example of prices increasing due to a reduction in production. Chunghwa Picture Tubes, LTD, 27 October 1999, Visitation Report, Topic: Exchange of Market Information and Price Review, CHU00029171 - CHU00029174, at 9174E. 20 February 2013, Deposition of Chih Chun-Liu, Volume II (Hereinafter "Deposition of Chih Chun-Liu, Vol II, 20 February 2013), at 363:12 - 363:22.
- In 2000 Chunghwa audited and confirmed that Samsung's Shenzhen plant had shutdown 17" CDT production. Chunghwa Picture Tubes, LTD, 09 April 2000, Visitation Report, CHU00030998, at 998E.
- A chart shows that Chunghwa and Samsung each planned and shut down five lines, and LPD planned to shut down six lines and actually shut down seven and a half lines. Chunghwa Picture Tubes, LTD, 27 December 2002, Itinerary, CHU00660487 - CHU00660500, at 0495.
- A chart that describes a two-step shutdown plan has a note that states: "2nd step seems to to [sic] be implemented in advance than previous agreement." Samsung, 24 February 2005, Itinerary, SDCRT-0091605 - SDCRT-0091615, at 1611.

[115] See, e.g.,

- "In deciding whether to violate the antitrust laws, or to engage in conduct that may result in a finding of a violation, a rational firm will aggregate the expected punishments and discount (multiply) them by the probability of their imposition to determine the expected punishment cost for engaging in that conduct." Posner, Richard, 2001, Antitrust Law, Second Edition, University of Chicago Press: Chicago, at 47.
- "Only if a cartel is expected to raise the price above the noncartel price and keep it high do firms join. If the noncartel price is close to the cartel price, then firms may not believe that joining the cartel is profitable given the legal liability they potentially face from belonging to a cartel." Carlton, Dennis W. and Jeffrey M. Perloff, 2005, Modern Industrial Organization, Fourth Edition, Person Addison Wesley, at 131 and accompanying footnote.

CRT industry executives, continued to actively participate in the cartel for years is strong evidence that their continued participation elicited a benefit at least as large as the cost of participation.[116]

It might be plausible that cartel members were mistaken in their belief that they had market power, if the cartel had tried to raise prices and failed one or two times or for a short time period, but it is improbable that the cartel attempted the impossible over and over again for over twelve years, risking millions in fines and even jail time, without giving up. Cartel members were the leaders of large companies in a large industry and should be presumed to know, after repeated attempts, whether they had succeeded in raising price. Given the on-going conduct, they must have believed they succeeded.

Cartel members thereby demonstrated their belief that the cartel had market power, for without it, their on-going attempt to raise price would have been irrational: without market power, the cartel would have no effect on price and the firms would simply earn lower profits. Antitrust authorities recognize that conduct that would be irrational in the absence of market power is evidence of the possession of market power.[117]

2. Defendants had the market power to raise prices

By definition, a cartel must possess market power in order to raise price above the competitive level. Defendants' conduct, testimony, and contemporaneous business documents show that the cartel members recognized that they had market power. There are two very direct limits to a cartel's market power: production by non-cartel firms and new entrants. As the cartel attempts to restrict output and increase price, the resulting increase in profits encourages either non-cartel firms or new firms to increase output.

Based on my analysis described below, I conclude that non-cartel firms and new entrants did not and could not fully offset the cartel's efforts.

a) The cartel's market power was not eliminated by non-cartel members

If a cartel attempts to increase price and a substantial number of its customers are able to avoid the higher price by switching to a lower-priced supplier outside the cartel, then the cartel will be forced to abandon the higher price. For this reason, a cartel must control a substantial share of the market supply in order to raise prices above the competitive level.[118,119]

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[116] "Particularly in large industries with significant stakes, the firms involved will ordinarily have a better grasp of industry conditions and of their own ability to succeed in spite of them than will an outsider. Thus, if one sees clear attempts to coordinate or strong evidence that oligopolistic coordination is successful, the better inference is that the mistake lies not with the firms' analysis of conditions but rather with the enforcer's." Kaplow, Louis, 2011, An Economic Approach to Price Fixing, Antitrust Law Journal, 77(2), 343-449.

[117] "Some conduct benefits actors only if it supports supracompetitive prices. Because such conduct would be irrational for the perfectly competitive firm, its occurrence indicates that the defendant has (or believes it has) some degree of market power." Areeda, Philip E., Hovenkamp, Herbert, et al., 2007, Antitrust Law: An Analysis of Antitrust Principles and Their Application, Volume IIB, Third Edition, Aspen Publishers, at ¶520a.

[118] Salant, Stephen W., Switzer, Sheldon, et al., May 1983, Losses from Horizontal Merger: The Effects of an Exogenous Change in Industry Structure on Cournot-Nash Equilibrium, The Quarterly Journal of Economics, 98(2) pp. 185 - 199.

[119] Identifying a relevant antitrust market and computing market shares is an indirect means of assessing market power. The relevant antitrust market includes all products sufficiently substitutable such that a hypothetical

The CRT cartel dominated the supply of CRTs as a whole and CPTs and CDTs separately; see Exhibits 4, 5, and 11 and Section VI.C.1. Cartel members accounted for at least 85% of CPT and CDT sales for years in which I have found reliable data (from 2000 through 2006 for CPT and 1998 through 2006 for CDT).

Moreover, the CRT cartel possessed 89.0% of the capacity to produce CRTs; see Exhibit 12. Therefore, when the cartel restricted output of CRTs, that output reduction could not readily be offset by increased production of CRTs by non-cartel suppliers; non-cartel suppliers had the capacity to produce only about 10% of the CRTs demanded. Because non-cartel suppliers lacked sufficient capacity to significantly increase their market share, they had little reason to maintain low prices in response to cartel members' supra-competitive pricing. Accordingly, non-cartel suppliers acting in their own self-interest would be expected to raise prices above the competitive level along with cartel members.

Sony, the largest non-cartel CRT manufacturer, accounted for a relatively small and declining share of production. Sony's share of global CPT production fell steadily from around 7% in 2000 to under 3% in 2006 and its share of CDT production fell from around 8-10% in the mid-1990s to zero when it exited the market in 2004.[120]

I therefore conclude that the few competitively-supplied CRTs available as alternatives to cartel-supplied CRTs were insufficient to prevent the cartel from raising prices.

b) The cartel's market power was not eliminated by entry

If a cartel is successful in raising prices above the competitive level, the prospect of high profits may induce firms not currently operating in the industry to enter. If these entrants are sufficiently large or numerous and are not co-opted by the cartel, entrants could potentially undercut the cartel's prices and return the industry to a competitive state. Long-term cartel success therefore depends on the ability to prevent economically significant entry or co-opting entrants. Below, I show that during the class period, economic conditions in the CRT industry deterred entry and there was no meaningful entry in the CRT industry.

(1) Barriers to entry deterred entry

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monopolist over products in the relevant antitrust market could set prices above the competitive level by a small but significant amount for a non-transitory period of time. This is according to the Department of Justice's "Hypothetical Monopolist Test", sometimes called the "SSNIP (small but significant and non-transitory increase in price) Test". See, e.g.,

- Areeda, Philip E., Hovenkamp, Herbert, et al., 2007, Antitrust Law: An Analysis of Antitrust Principles and Their Application, Volume IIB, Third Edition, Aspen Publishers, at ¶532a.
- "The measurement of market shares and market concentration is not an end in itself, but is useful to the extent it illuminates the merger's likely competitive effects." 2010 Merger Guidelines U.S. Department of Justice and Federal Trade Commission, 19 August 2010, 2010 Horizontal Merger Guidelines, at Section 4.

[120] See, e.g.,

- MT Picture Display, November 2006, Untitled Spreadsheet of CPT and CTV data, MTPD-0416090.
- Samsung, 11 December 2003, Worldwide CDT Manufacturer's Status, SDCRT-0201291.
- DisplaySearch, 07 July 2005, Q2'05 Quarterly Desktop Monitor Shipment and Forecast Report, CHWA00088192 - CHWA00088762, at 8484.

As discussed in Section VI.B.3, barriers to entry deterred entry. Entry into CRT manufacturing required a large capital investment and could take years. Technical knowledge was also important; even incumbent CRT manufacturers experienced difficulties when establishing new production facilities. The cost, time and risk associated with entering the CRT manufacturing industry would tend to discourage entry.

(2) CRT industry conditions deterred entry

As I showed in Section VI.C.2, the CRT industry was characterized by excess capacity and low returns to capital for much of the class period. Such conditions deter entry of new firms into an industry (even if it is cartelized) for multiple reasons. When excess capacity causes producers to earn less than a competitive return on their investments, potential entrants will not make the large investments necessary to participate in the CRT industry.[121] The low rate of return makes entry undesirable because potential entrants can earn higher returns in other industries.

Excess capacity in the CRT industry also deters entry. Even if the cartel's prices are high enough to make entry attractive, the presence of excess capacity makes known to potential entrants that incumbents have the ability to respond quickly with a price war if significant entry is attempted. To a potential entrant, the excess capacity is a credible threat that, even though prices may be high now, if it were to enter the market the existing firms would increase output, causing prices to fall significantly, making the decision to enter unprofitable ex post. When there is excess capacity, then, cartel members can charge prices above the competitive level, sheltered from competition by entrants.[122]

(3) There was no meaningful entry in the CRT industry

Two new CRT industry participants appeared late in the class period. Videocon acquired all of the capacity of Thomson, a cartel member, in 2004 and 2005.[123] This "entry" did not increase total industry capacity, it was merely a change in the ownership of existing capacity. If, as Plaintiffs allege, Videocon took Thomson's place in the cartel,[124] then the acquisition of

[121] See, e.g.,

- "Entry is not to be expected when established firms are losing money, anticipating a market decline, or carrying large amounts of excess capacity. Nor is entry assured into a market earning only the competitive rate of return." Areeda, Philip E., Hovenkamp, Herbert, et al., 2007, Antitrust Law: An Analysis of Antitrust Principles and Their Application, Volume IIB, Third Edition, Aspen Publishers, at 22.
- A standard finance textbook explains that firms will generally only make investments that offer rates of return in excess of their opportunity costs of capital, also known as above-normal returns. Brealey, Richard A., and Stewart C. Myers, 2000, Principles of Corporate Finance, Sixth Edition, McGraw-Hill College, at 19.

[122] See, e.g.,

- Dixit, Avinash, March 1980, The Role of Investment in Entry-Deterrence, The Economic Journal, Vol. 90, No. 357, 95 - 106.
- Maskin, Eric. S., 1999, Uncertainty and Entry Deterrence, Economic Theory, Vol. 14, 429–437.

[123] Videocon acquired Thomson's plant in Italy in January 2004, and all of Thomson's remaining CRT capacity, located in China, Mexico, and Poland, in July 2005. Thomson Videocon I.F.A. Presentation, PHLP-CRT-005242, at 2-3 and Thomson, 2005, Thomson Exits Tube Business Ahead of Schedule, PHLP-CRT-030355 - PHLP-CRT-030372.

[124] Complaint, at ¶189.

Thomson's production capacity would have had no impact on the cartel's ability to raise prices. There is evidence that after the acquisition, in 2005, a senior Videocon executive shared pricing information and production plans with Samsung in an effort to coordinate output reductions.[125] Even if Videocon did not participate in the cartel after the acquisition, the sale would have resulted in a relatively small shift in production capacity from within the cartel to a non-cartel member. Thomson's share of CPT production capacity just prior to the acquisition was 8.6%.[126]

Baoma began producing 14" CPTs in China in 2007 with a single production line it acquired from LPD's Barcelona plant.[127] Operations had ceased on the LPD production line prior to its acquisition by Baoma,[128] so moving the line to China and placing it in service might be argued to have been an increase in industry capacity. Because Baoma's entry was so small and so late in the class period it had no significant effect on the power of the cartel to raise prices on products purchased by U.S. consumers during the class period. Baoma's capacity was only one million units per year, which was only 3% of 2006 industry production of almost thirty million 14" CPTs.[129]

c) The cartel's market power was not eliminated by LCDs

Prior to the late 1990s, there were no viable alternative technologies to CRTs for either monitors or televisions. Over the succeeding decade, LCD displays largely displaced CRTs in both monitor and television usage.[130] The change from LCDs to CRTs is illustrated in Exhibits 13 and 14. Worldwide shipments of LCD monitors outstripped CRT monitors during 2004, and LCD TV shipments outstripped CRT TVs in 2008.

The growing popularity of LCD products led to a shrinking market for CRT products but, as I explain below, the CRT cartel members maintained supra-competitive prices throughout the damages period. They were able to do so because few customers' purchase decisions were sensitive to changes in the price of CRT products. If the CRT cartel members tried to reduce their prices to compete with the far more expensive LCD products, they would not have been able to persuade enough additional consumers to buy CRT products to make up for the money they would lose by lower prices. The fact that consumers are not very price-sensitive is

[125] "Recently, when the newly appointed TOP (Indian) of the former TH [Thomson] Co. was consulted, he mentioned that the former TH Co. (current V [Videocon] Co.) 1. Is selling its inventory at low prices until March of next year and 2. It thinks it would like to reduce its production CAPA by 20% from a current 20 MIL to 16 MIL. S Co. stated that, if each of the companies, S, L, M and V [Samsung, LG, MTPD, and Videocon, respectively], reduces its production by 20% (as of this year), supply would become tight and it would be possible to halt the drop in prices by 7 - 8%. MT Picture Display, 12 December 2005, December 12th Korea Meeting Minutes, MTPD-0410020 - MTPD-0410021, at 0020E.

[126] MT Picture Display, November 2006, Untitled Spreadsheet of CPT and CTV data, MTPD-0416090.

[127] March 2007, SDI CRT Line Status, LGE00067202, at tab "CHINA LOCAL".

[128] MT Picture Display, 04 July 2005, CRT Line Status Jun 05, MTPD-0575968.

[129] LG Electronics, 06 March 2007, Global C-CRT Line Status, LGE00091909 and MT Picture Display, November 2006, Untitled Spreadsheet of CPT and CTV data, MTPD-0416090.

[130] Other display technologies were also available in televisions during the class period but were generally not functional substitutes for CRT displays due to size limitations. Alternative display technologies include plasma, and rear projection displays using CRT, LCD, digital light processing (DLP), and liquid crystal on silicon (LCOS). Plasma and rear projection displays are generally larger than the biggest CRT TVs. DisplaySearch, May 2011, Analysis Group, Inc. Custom Data Project, DISP_LCD_000128.

illustrated by the growing popularity of LCD monitors and TVs despite their hefty price premiums over comparably-sized CRT products. While LCD products may have been functionally superior to CRT monitors and TVs, they did not prevent the CRT cartel from imposing cartel overcharges on U.S. end-users of CRT monitors and TVs during the damages period.

(1) Defendants maintained supra-competitive prices despite the encroachment of LCD finished goods

There are two related reasons why the growing popularity of LCD monitors and TVs might cause CRT prices to fall. First, when large numbers of consumers started buying LCD finished goods, they stopped buying CRT finished goods. This secular decline in demand, coupled with excess CRT production capacity, caused the "sick industry problem" discussed in Sections VI.C.2, VI.C.2.a), and VI.C.2.b). Absent collusion, participants in a sick industry are expected to engage in "cutthroat" or "ruinous" competition, in which prices fall so far that suppliers earn less than the competitive rate of return. Second, if the declining prices of LCD finished goods constrained the price that the cartel could charge for CRTs, CRT prices might fall as LCD prices fall.

In fact, CRT prices exhibited remarkable resiliency in the face of LCD encroachment, indicating that the cartel successfully avoided cutthroat competition by collusively maintaining cartel prices and that the prices of CRTs were not constrained by prices of LCD finished goods.

Generally, prices of CDTs and CPTs had been declining since at least 1995, well before the advent of LCD technology; see Exhibits 15 and 16. When consumers began buying significant numbers of LCD monitors around 2001, CDT manufacturers did not respond by accelerating the downward price trend as would be expected if LCDs constrained their prices. Instead, the downward trend in CDT prices slowed. For example, the average price of a 15" CDT in 1995 was $149, falling to $46 in 2001 and $26 in 2007. From 1995 to 2001, the price of a 15" CDT declined by about 18% per year; that downward trend slowed to 9% per year from 2001 to 2007, a period when LCD monitors increased in popularity to dominate monitor sales. See Exhibit 13. This pattern of CDT pricing is evidence that LCD monitors did not constrain the price Defendants charged for CDTs.

CPT prices also exhibited a downward trend in the years before consumers began buying significant numbers of LCD TVs in 2005. For example, the average price of a 20" CPT in 1995 was $69, falling to $38 in 2004 and $32 in 2007. From 1995 to 2004, the price of a 20" CPT declined by about 6% per year; that downward trend was relatively unchanged from 2004 to 2007, the period during which LCD TVs began to supplant CRT TVs. See Exhibit 14.

(2) Defendants recognized the inevitable decline of CRT demand

Defendants' contemporaneous business documents demonstrate their understanding that CRT demand would decline due to increasing LCD popularity.[131] If the Defendants viewed CRT's

[131] See, e.g.,

- "Also, the CRT TV market will not be able to prevent an LCD invasion, so expect CRT market demand to continuously decrease." Samsung SDI, August 2005, Competitor China Visit Report, SDCRT-0091524 - SDCRT-0091530, at 1529E.

competition with LCD as being driven by price, they would have reduced CRT prices to fight the LCD encroachment. But the defendants instead colluded to hold prices steady or reduce prices only slowly, despite the losses to LCD.[132] This strategy reveals a business judgment that CRT manufacturers could not profitably respond to LCDs by reducing prices: that LCDs are not a price-constraining alternative to CRTs. The defendants also indicated that it was only through mutual cooperation, through their cartel activities, that they could mitigate the decline in CRT prices.[133]

(3) LCDs are not functional substitutes for CRTs though LCD products are functional substitutes for CRT products

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- "This fiscal year, affected by the replacement by LCD, the CDT market situation has become low." Chunghwa Picture Tubes, LTD, Undated, [Untitled Document], CHU00624682, at 4682E.
- "*CDT monitor W/W* [worldwide] demand is decreasing …" Chunghwa Picture Tubes, LTD, 27 March 2003, Trip Report, CHU00031822 - CHU00031824, at 1822.01E

[132] See, e.g.,

- "To control the big CDT picture and to avoid accelerated deterioration [in the face of LCD replacement], CPT/LPD/SDI [Chunghwa, LPD, and Samsung] settled: together KEEP the price in the short term to ensure that the 3 makers can KEEP a definite profit." Chunghwa Picture Tubes, LTD, Undated, [Untitled Document], CHU00624682, at 4682E.
- "[A]ll makers have a common hope for *CDT* prices not to continue to drop in 2003, and to establish a regular contact and communication meeting among each other to strengthen market information exchange and mutual restraint." Chunghwa Picture Tubes, LTD, 27 March 2003, Trip Report, CHU00031822 - CHU00031824, at 1822.01E.
- "Monitor the circumstances of the LCD price, but maintain the current [CDT] price level for the time being." Samsung SDI, 28 July 2004, Report of the CDT MTG Result, SDCRT-0090319 - SDCRT-0090321, at 0319E.
- "[Heading] Purpose of Visit … (3) CDT price maintenance…." Samsung SDI, Lee, Jae In, 03 March 2003, E-mail, Subject: Report on Mitsubishi Meeting Result, SDCRT-0006041, at 6041E.

[133] See, e.g.,

- "We are attempting to cooperate closely with CDT. We have prevented a price decline of around the 12% level even though LCD has been attacking us this year. There has been cooperation within the CDT industry through an an [sic] active adjustment of supply depending on changes in demand based on an exchange of information between the actual workers. Also we have held TOP MEETINGs 1 - 2 times a year. … With LCD, we expect the monitor area will grow by up to 65% this year from [market share] 50% last year. We think that this trend will continue but CDT has been cooperating very closely within the industry." Samsung SDI, August 2005, Competitor China Visit Report, SDCRT-0091524 - SDCRT-0091530, at 1525 – 1526, 1528E
- "Also, the CRT TV market will not be able to prevent an LCD invasion, so expect CRT market demand to continuously decrease. Cooperation within the industry is critical and is a survival issue. If there is proper cooperation within the industry during the first half of the year, there should not be an inventory issue and we may prevent loss due to a price drop." Samsung SDI, August 2005, Competitor China Visit Report, SDCRT-0091524 - SDCRT-0091530, at 1528E.
- "Hope with both sides' sufficient communication and no malicious competition, can hold the market price [of 14" CPT] and create a win-win opportunity." Chunghwa Picture Tubes, LTD, 18 October 2005, Market Contact Report, CHU00040992 - CHU00040993, at 0992E.

Economists describe demand for CRTs as "derived demand": the final consumer wants the product (CRT) not for its own, intrinsic properties, but because possessing the good is a prerequisite for some other consumption the consumer desires. That is, the final consumer wants to watch television or view the files on her computer. To do either, the consumer needs a display device – a computer monitor or TV. This demand for CRT finished goods in turn leads to derived demand for CRTs by the firms that manufacture CRT monitors and TVs. CRT finished goods manufacturers have no alternative to using CRTs; there is no way to produce a CRT monitor or CRT TV without a CRT.

Final consumer substitution can occur across alternative products that are functional substitutes – a computer user may consider alternative monitor technologies that allow her to view her file contents, or a television viewer may consider alternative TV technologies as long as the set plays his desired shows. This demand substitution is occurring at the end-consumer level, not at the direct purchaser level: a company producing CRT TVs and CRT monitors will demand CRTs – it cannot use alternative display technologies inside its CRT-based products.

(4) Functional substitutes are not necessarily economic substitutes

A functional substitute may constrain the price that a seller can charge or it may not. That is, even if Products A and B perform similar functions, the seller of Product A may be able to charge a supra-competitive price without losing a sufficient share of its customers to Product B so as to make the supra-competitive price unprofitable. In this case, Product B does not constrain the price of Product A to the competitive level. On the other hand, if enough customers respond to supra-competitive pricing of Product A by buying Product B, then the seller(s) of product A will find it unprofitable to charge supra-competitive prices. In this case, Product B is a price-constraining (economic) substitute for Product A.

Consider a more concrete example of functional substitutes that are not price-constraining substitutes. The owner of the only movie theater in a college town observes that her Saturday afternoon matinee showings attract far fewer viewers on weekends when there is a home football game. She notes that tickets to the football game can be purchased online for $200, whereas her Saturday matinee costs $10. She tries a promotion, setting the price of matinee tickets at $5 the weekend of the next home game; she finds the lower price attracted essentially no additional viewers to the matinee. She concludes the football game is not a relevant economic substitute for her pricing decisions, despite the fact it is a functional substitute that affects the level of demand for her product: she cannot sufficiently affect relative prices of the two products to induce prospective consumers of the much more expensive good to instead buy her product.

(5) LCDs are not economic substitutes for CRTs

Now consider the impact of LCDs on the demand for CRTs, given that functionally an LCD monitor or TV substitutes for a CRT monitor or TV. Unless consumers consider LCD finished products an economic substitute for CRT finished goods, then the CRT cartel could maintain supra-competitive CRT prices even as LCD products entered the market. That is, the CRT cartel would eliminate its cartel overcharge in response to growing LCD sales only if the resulting change in the relative prices of LCD and CRT products would keep enough prospective consumers buying CRT products to offset the effect of lower CRT prices on cartel profits.

Like the football tickets in the example above, LCD finished goods were much more expensive than their functional substitutes, CRT finished goods. Broadly, LCD products were at least twice

(and sometimes as much as four times) as expensive as CRT products until about 2005 and remained about 50% or more expensive as of 2007. See Exhibits 17-22. Given these price differences, it is clear that consumers chose to buy LCD monitors and TVs over CRT products for the benefits of LCD technology, including size and weight, rather than on the basis of price.

Because LCD finished goods were so much more expensive than comparable CRT products, a small decline in the price of a CRT would change the relative price of a CRT monitor or TV by an even smaller amount. For example, in 2005, a 20"-21" CRT TV cost about $150 and the CPT inside the TV cost approximately $40. A 20" inch LCD TV cost almost $550.[134] Suppose the CRT manufacturer reduced the cost of the CPT used in that CRT TV by 5% and that this cost change was fully passed through to the CRT TV price.[135] The CRT TV price would decline by approximately $2 from its price. Very few consumers who were willing to pay $400 more for the LCD TV would change their minds and buy the CRT TV if they would have to pay $402 more for the LCD TV over the CRT TV.

The large price difference between LCD and CRT products meant that the cartel's overcharge represented a small part of the relative price of LCD and CRT finished goods. For example, I estimate that the cartel overcharge on a 17" CRT monitor in 2002 amounted to $13.43 in 2002 and the overcharge on a 20"-21" CRT TV in 2004 was $3.60.[136] Eliminating these overcharges was unlikely to cause a significant number of prospective consumers of the far more expensive LCD finished goods to buy CRT finished goods. Consumers who had decided to pay a significant premium for an LCD monitor or TV were not likely to switch to a CRT monitor or TV even in the absence of the cartel overcharge. Thus, LCD penetration in the display market gave the CRT manufacturers little incentive to price their products competitively.

(6) Falling LCD prices did not prevent a CRT overcharge

Further evidence that prospective LCD product buyers would not have responded to slight decreases in the price of CRT products can be seen in changing purchase patterns over time. As LCD technology advanced, the prices of LCDs and LCD products declined. Consumers could choose between spending less and less for a given size LCD display or could instead "spend" some of the "savings" from lower prices on a larger display. The data revealed that as the prices of LCD monitors and TVs fell over the class period, consumer demand shifted to larger and larger screens. For example, in 2001, the average price of a 17" LCD monitor was more than $800 and only 14 % of LCD monitors sold were 17" or larger. See Exhibits 18 and 23. By 2005, the price of a 17" LCD monitor had fallen below $300 and 84 % of LCD monitors sold were 17" or larger. A similar pattern occurred in the LCD TV market. See Exhibits 20-22 and 24. The fact that consumers "traded up" in size as prices fell suggests the characteristics of monitors and TVs are more important to consumers than price and therefore consumers would not respond

[134] The prices for the 20" LCDTV and the 20"-21" CRT TV were $549 and $157, respectively. DisplaySearch, May 2011, Analysis Group, Inc. Custom Data Project, DISP_LCD_000128.

[135] Throughout this discussion, I assume a 100% pass-through rate. My conclusions would not be materially affected if pass-through was slightly more or less than 100%. See Section X for my estimation of the magnitude of pass-through in this industry.

[136] I multiplied the estimated overcharge (see Section IX) by the average price of a 17" CDT in 2002 and by the average price of a 20"-21" CPT in 2004 to obtain the dollar overcharge on these two products at these two points in time.

sufficiently to changes in CRT prices by substituting LCD finished goods to make a CRT price decline profitable.

(7) Consumers would not have substituted LCD finished goods in sufficient numbers to prevent supra-competitive pricing of CRTs

As described above, CRT manufacturers' would charge competitive prices only if lowering the CRT price to competitive levels would have induced a sufficiently large number of consumers to switch from buying LCD products to CRT products. The lower CRT price would mean lower profits per unit for Defendants, and the question is whether enough consumers would switch so that more CRT sales would make up for the lower profits for each sale.

For a given price change, we can estimate the number of consumers that would need to be enticed to substitute between LCD and CRT finished goods in order for it to be profitable for Defendants to eliminate their overcharge. Such a calculation is similar to "critical loss analysis", which economists routinely use to determine whether a merger is likely to increase prices.[137] By estimating the profit earned on each CRT, I determined the reduction in profit per tube resulting from a given price reduction and, since I know how many tubes were sold, the total reduction in profit. I then calculated how many additional CRTs would need to be sold at the new per-tube profit to compensate for the reduced profits on existing CRT sales.

A key input to the calculation is Defendants' gross profit margin (price minus marginal cost) on each CRT sold. I assume a 40% gross profit margin for the purpose of this analysis, which is higher than the handful of estimates I've seen.[138] The higher the gross profit margin, the fewer additional sales are necessary to make a price decrease profitable. Another key input to the

[137] See, e.g.,

- Farrell, Joseph and Carl Shapiro, February 2008, Improving Critical Loss Analysis, The Antitrust Source, Vol. 7, No. 3.
- Coate, Malcolm B. and Jeffrey H. Fischer, October 2006, A Practical Guide to the Hypothetical Monopolist Test for Market Definition, Potomac Papers in Law and Economics 06-01, 1 - 48.

[138] See, e.g.,

- Hitachi, August 2001, Hitachi Electronic Devices (U.S.A.), Inc., HDP-CRT00057240 - HDP-CRT00057284, at 7247.
- LG.PHILIPS, 16 September 2003, Supervisory Board Meeting, PHLP-CRT-003818 - PHLP-CRT-004240, at 15-16.
- 28 August 2003, CDT Market Review, CHU00031194 - CHU00031201, at 1196.02E.
- Beijing-Matsushita Color CRT Company, 13 February 2006, BMCC-CRT000083813, BMCC-CRT000083813.
- Lehman Brothers, 14 February 2007, Chunghwa Picture Tubes (2475.TW - TWD 6.39) 2-Equal weight, CHU00063266 - CHU00063277, at 3270.
- Samsung, 2007, Electronic File of SDCRT-0216503, SDCRT-0216503.
- Salomon Smith Barney Inc., 22 May 2001, Project Mercury Confidential Information Memorandum, EIN0017699 - EIN0018075.

analysis is the magnitude of the overcharge. For the purpose of these calculations, I assumed an overcharge of 5% for CPTs and a 20% overcharge for CDTs.[139]

Given a 40% gross profit margin and a 5% overcharge, Defendants would need to sell approximately 14% more CPTs at competitive prices to make eliminating a 5% overcharge profitable. See Exhibit 25 for the gain in sales needed to make reducing price by 5% profitable. Given a 40% gross margin and a 20% overcharge, Defendants would need to sell approximately 100% more CDTs in order to profit from eliminating the overcharge. See Exhibit 26.

To provide context for the CRT sales volumes, Exhibits 25 and 26 also include the sales volumes for LCD finished goods. For most of the damages period, the number of additional CRT sales necessary to make eliminating the overcharge profitable is greater than the total number of LCD sold. In other words, even if a 5-20% price cut for CRTs was sufficient to induce all consumers who purchased LCD TVs and monitors to switch to CRT products, that still would not have been enough to make the price cuts profitable for CRT makers.

I conclude that it is implausible that sufficient consumers would have purchased CRTs rather than LCDs to make eliminating the cartel overcharge profitable.

(8) Summary: LCDs did not eliminate the CRT cartel's ability to impose an overcharge

Defendants understood that LCD monitors and TVs would supplant CRT technology. Despite this, they maintained or slowed the pace at which CRT prices had been falling. They were able to do so because LCD monitors and TVs are not economic substitutes for CRT finished goods and did not meaningfully constrain CRT prices.

3. The cartel implemented a comprehensive plan to exercise its market power

Economists have identified a number of practices common to successful cartels.[140] Fixing more than just price (e.g., product quality or contract terms), fixing market shares, and assigning customers to suppliers affords cartel members multiple opportunities to detect non-compliance with the cartel agreement. Fixing capacity is a readily-verifiable means of placing limits on cartel members' ability to cheat. Cheating can be discouraged by cartel members by granting their customers most-favored customer clauses and meeting-competition clauses, which promise customers they will receive at least as low a price as that charged all other customers. Such terms reduce the incentive to cheat by requiring that discounts not be given opportunistically to capture incremental customers while continuing to charge higher prices to other customers, but must be given to all customers.

[139] As I discuss in Section IX, I estimated a 25.0% overcharge rate for CDTs prior to the investigation of the LCD cartel becoming public; after the LCD investigation became public that falls to 12.3%. For CPTs I estimated overcharges of 9.5% and 3.2%. I used the figures 5% and 20% here because smaller overcharges are conservative for these calculations.

[140] Carlton, Dennis W. and Jeffrey M. Perloff, 2005, Modern Industrial Organization, Fourth Edition, Pearson Addison Wesley, at 139, 141-144.

Two prominent cartel scholars found that other practices of successful cartels include developing a hierarchy that includes both top-level executives and working-level members; building trust; using multi-pronged strategies; and learning from experience.[141]

Next, I compare the practices of the CRT cartel to the practices proven to have been successful for other cartels.

a) The cartel established a hierarchy of meetings

Collusion among members of the cartel began at least as early as February 1995, when LG, Orion, and Samsung met to discuss CPT pricing, production, and sales.[142] Approximately three months later, LG and Chunghwa met "to discuss the background for a CPT CDT price increase, and the price increase range as well as to exchange market information."[143] Notes from this meeting also show that communication regarding price increases had occurred or was planned with "all CPT/CDT Makers in Thailand, Malaysia and Singapore", including Samsung, Thai-CRT, and Toshiba. The information exchanged included current prices, plans for future prices, negotiations with customers, current and planned future capacity, and output.

Over time, such bilateral meetings led to more formal, multilateral meetings of cartel members' managers called "Glass Meetings", at which the cartel fixed prices, restricted output and capacity, allocated customers, and shared sensitive information. The Glass Meetings continued at least through February of 2007.[144] Regular attendees of the Glass Meetings included Chunghwa; LG, Philips, and LPD; MTPD; Orion (Daewoo); Samsung SDI; Thai CRT; and Thomson.[145] I listed the employer of attendees at all meetings that were explicitly called "Glass Meetings" in Exhibit 27.

The cartel established a hierarchy of meetings with three levels: Top Management Meetings, Management Meetings, and Working Level Meetings.[146] Top Management Meetings were held

[141] Levenstein, Margaret and Valerie Suslow, March 2006, What Determines Cartel Success?, Journal of Economic Literature, Vol. 44., at 43-44, 67.

[142] 14 February 1995, Mid-Long term investment strategy for overseas strategic regions, SDCRT-0086208 - SDCRT-0086210.

[143] Chunghwa Picture Tubes, LTD, 29 May 1995, CPT Sales & Marketing Division Visiting Report, CHU00028933 - CHU00028945, at 8933.01E.

[144] Glass Meeting on 8 February 2007 attended by Chunghwa, MTPD, SDI, and LPD. Jimmy, Wu, and Meng Ying, February 2007, Market Visitation Report (Glass Meeting), CHU00030437 - CHU00030438, at 0437.01E.

[145] CC Liu, Chunghwa's vice president of sales, testified to the regular meeting participants. "[Q.] At any period of time, from the period of time 1995 to 2005, when you left Chunghwa, what companies did you meet with at the group meeting? A. Samsung, LG, Philips, Orion, Thai CRT. In the first stage there was one more company that joined the venture of Toshiba and Matsushita… I mentioned LG and Philips separately but for the period you mentioned, from 1995 to 2005, LG and Philips merged in one. The company merged by LG and Philips in 2001 certainly appeared in the later group meetings." I believe that the "one more company that joined the venture of Toshiba and Matsushita" refers to the joint venture of Toshiba and Matsushita (i.e., MTPD). 19 February 2013, Deposition of Chih Chun-Liu, Volume I (Hereinafter "Deposition of Chih Chun-Liu, Vol. I, 19 February 2013), at 50:1 - 50:17.

[146] See, e.g.,

- "Q. Thank you. You previously talked about how in 1998 David Chang from Philips came up with a method to better structure the glass meetings, and that there was top level CEO meetings and then there were management-level meetings. My question is: were there other working-level meetings that were also

quarterly for much of the class period, trailing off to one to two meetings per year in the later years, and were attended by high-ranking executives such as Presidents, Vice Presidents, and Chief Operating Officers.[147] Chairmanship of the Top Level Meetings was assigned to executives from different cartel members on a rotating basis.[148] The function of Top Level

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created by Mr. Chang? [objection omitted] THE WITNESS: There were such working-level meetings, however not regularly. BY MR. SAVERI: Q. How often would the working-level meetings meet? A. That depends on the needs. Normally it will not be too long. Sometimes one meeting a month. Sometimes meeting in two months." Deposition of Chih Chun-Liu, Vol. I, 19 February 2013, at 73:1 - 73:18.

- A meeting held on 18 January 1999 planned for a Working Level Meeting on February 10 and a Top Meeting on March 5. Samsung SDI, 18 January 1999, CDT Industry (January 18, '99) Meeting Result, SDCRT-0086557 - SDCRT-0086560, at 6559E.
- A meeting held on 14 April 1999 planned for a Management Meeting on May 21 and a Top Meeting on May 25/26. Samsung SDI, 19 April 1999, Report on the April 14 Management Meeting Results, SDCRT-0086593 - SDCRT-0086596, at 6593E-6594E.

[147] See, e.g.,

- "Q. You indicated that there were monthly meetings of the group meetings. Were there monthly meetings of the CEOs from 1997 onwards? [objection omitted] THE WITNESS: The monthly meeting will be attended by people who are heads of the sales for people of sales VP or above. The CEO met about every quarter, every three months, if there were emergent meetings, CEOs could be called to have such urgent meetings every two months or so." Deposition of Chih Chun-Liu, Vol. I, 19 February 2013, at 53:17 - 54:2.
- "Top meeting: once/quarter." Samsung SDI, November 1998, CDT Industry (11/28, 29) Meeting Results, SDCRT-0086445 - SDCRT-0086448, at 6445E.
- "Various makers agreed to change, from now on, to hold Top-Management meeting every 2 months and Working Level Meeting every month." Chunghwa Picture Tubes, LTD, 24 July 2001, Visitation Report (submitted), CHU00036384 - CHU00036385, at 6384.03E.
- "Q. And the top meetings that you attended with J.S. Kim in 2002 and 2003, approximately how often would they occur? [objection omitted] THE WITNESS: I think it occurred – they occurred once every three to six months." 07 June 2012, Deposition of Samsung SDI 30(b)(6) Witness Jaein Lee, Volume II (Hereinafter "Samsung SDI 30(b)(6) Deposition of Jaein Lee, Vol. II, 07 June 2012"), at 226:8 - 13.
- "[W]e have held TOP MEETINGs 1 - 2 times a year." Samsung SDI, August 2005, Competitor China Visit Report, SDCRT-0091524 - SDCRT-0091530, at 1525E.
- "General meeting attended by the presidents of the 5 companies: 2nd meeting to be held end of Sept. to continuing [sic] from 1st meeting on July 19." Samsung SDI, 18 July 1998, 7th CDT Industry Meeting (July 18) Results, SDCRT-0086416 - SDCRT-0086418, at 6418.
- A Top Management Meeting on 28 September 2005 included SDI's Vice President and Sales Vice President, LPD's Chief Operating Officer and Sales Vice President, and Chunghwa's Senior Vice President. Chunghwa Picture Tubes, LTD, 28 September 2005, GSM Top Management Meeting, CHU00014230 - CHU00014231.

[148] See, e.g.,

- A Top Management Meeting notes document stated: "A new chairman was selected [Bullet] Mr. Jim Smith was selected by Philips." Samsung Display Device, Philips, 20 August 2000, Top Management Meeting (August 20), SDCRT-0086675 - SDCRT-0086681, at 6676E.
- A meeting notes document stated: "It was resolved that the next meeting would be held at [Chunghwa] in Taoyuan (5/22 PM 13:00), SDI will be the chair." Chunghwa Picture Tubes, LTD, 18 April 2001, Overseas Visitation Report, CHU00024560 - CHU00024568, at 4560E.

Meetings was to reach agreement about cartel policy, such as prices, capacity, and division of the market. Meetings of top executives also occurred on golf courses, in conjunction with Top Level Meetings; these were called Green Meetings.[149] Events such as these for top executives are opportunities for members of the cartel to form personal relationships and build trust between cartel members.[150]

Management Meetings were held about once a month, sometimes as frequently as once a week, sometimes every few months.[151] The function of Management Meetings was to reach agreement

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- A Top Management Meeting notes document stated: "TV GSM's [Glass Meeting] chairman will be [Chunghwa] for one year." Chunghwa Picture Tubes, LTD, 30 April 2003, CPT market Report (Overseas Trip Report), CHU00123742 - CHU00123745, at 3742.02E.
- A meeting discussion agenda stated: "The 3 company meeting host (Chairman) has changed [pointing finger icon] SDI in '05 Yr. --> [Chunghwa] in '06 Yr." CDT, 13 March 2006, Main Discussion Agenda, SDCRT-0091715 - SDCRT-0091718, at 1717E.

[149] See, e.g.,

- Itinerary and arrangements for a Glass Meeting on 5 March 1999 and a Green Meeting on 6 March 1999. The Glass Meeting is evidently a Top Management Meeting because attendees include presidents and executive vice presidents from Orion, Samsung, Philips, LG, and presumably Chunghwa, who made the arrangements. 04 March 1999, Report (Submitted), CHU00021268 - CHU00021276, at 1269E.
- Itinerary for a Green Meeting held on the morning of 24 February 2005 with a Top Management Meeting scheduled for the same afternoon. Chunghwa Picture Tubes, LTD, 24 February 2005, CHU00661917, CHU00661917 - CHU00661928, at 1917.

[150] See, e.g.,

- "Q. When you say the CEO golfing day, so at the CEO meetings those were preceded with a day of golf and then the meeting? A. Which proceeds first is not fixed. Golfing and dinner are for increasing mutual trust. So normally meeting during the day followed by dinner in the evening and golfing the second day. These were for creating more confidence among participants." Deposition of Chih Chun-Liu, Vol. I, 19 February 2013, at 75:16-75:2.
- "[I]n order to make friendly contacts and strengthen mutual trust, the makers agreed that every 3-4 weeks they would take turns to host a Green Meeting (only two members from each maker) after the meeting is over." Chunghwa Picture Tubes, LTD, 09 November 1999, Visitation Report, CHU00030916 - CHU00030918, at 0916.02E.
- Itinerary for a Green Meeting held at Country Height Golf Resort on 6 March 1999 included an "Arrangement of awards for the Golf competition". 04 March 1999, Report (Submitted), CHU00021268 - CHU00021276, at 1268.01E-1268.02E.

[151] See, e.g.,

- "Q. Okay. Did – when those meetings occurred, did they – on the once a month – once a month basis, did those levels of meeting all occur on the same day? In other words, would you have a top management meeting, a management meeting, and a working level meeting all occurring on the same day, that particular day of the month? [objections omitted] THE WITNESS: To my recollection, again it depended on the time period, but initially the management meeting was once a month, and working level meeting was so that we could prepare for the management meeting. So working level meetings were held on the same day as the management meetings or one day before the management meetings. In terms of the top management meetings, it would happen once every six months or a year. It was irregular, and it depended on the schedules of the top people, and it would be adjusted based on that." Samsung SDI 30(b)(6) Deposition of Jaein Lee, Vol. I, 06 June 2012, at 32:15-33:10.

about cartel policy such as prices and capacity, exchange market intelligence, and to monitor the implementation of cartel agreements, such as compliance with cartel prices and capacity restrictions. Management Meetings were attended by sales directors and managers.[152] A third level of meetings, Working Level Meetings, were held on a more regular basis, often in order to prepare for Management Meetings.[153] Working Level Meetings were attended by sales staff and sometimes their supervisors.[154]

- "Meeting on the monitoring of the implementation of the agreement reached among the 5 companies [Bullet] Quantity: Once/month [Bullet] Price: Once/month." Samsung SDI, 18 July 1998, 7th CDT Industry Meeting (July 18) Results, SDCRT-0086416 - SDCRT-0086418, at 6418E.
- "Meeting running plan [finger icon] would be changed from current once a month meeting to quarterly or bi-monthly meeting." CDT, 13 March 2006, Main Discussion Agenda, SDCRT-0091715 - SDCRT-0091718, at 9717E.

[152] See, e.g.,

- A European TV Glass Meeting on 11 November 1999 was attended by a Director and Section Chief from Orion, two Directors from Samsung, and a Department Manager and Representative from LG, among other untitled participants from Philips and Chunghwa. Chunghwa Picture Tubes, LTD, 11 November 1999, Contact Report, Topic: European TV Glass Meeting, CHU00030917 - CHU00030919, at 0917.01E.
- A Glass Meeting on 22 April 2002 was attended by a Manager from SDI, an Assistant Manager from LPD, and a Manager and Assistant Manager from Orion, among other untitled participants from Chunghwa. Samsung SDI, April 2002, GSM Meeting Log in April of 2002, SDCRT-0087743 - SDCRT-0087744, at 7743E.
- A Glass Meeting on 8 September 2003 was attended by two Senior Managers from SDI, two General Managers from LPD, and a General Manager from MTPD, among other untitled participants from Chunghwa. CPT, 08 September 2003, CPT Glass Meeting Result Report, SDCRT-0088732 - SDCRT-0088733, at 8732.

[153] See, e.g.,

- "Q. Okay. Did – when those meetings occurred, did they – on the once a month – once a month basis, did those levels of meeting all occur on the same day? In other words, would you have a top management meeting, a management meeting, and a working level meeting all occurring on the same day, that particular day of the month? [objections omitted] THE WITNESS: To my recollection, again it depended on the time period, but initially the management meeting was once a month, and working level meeting was so that we could prepare for the management meeting. So working level meetings were held on the same day as the management meetings or one day before the management meetings. In terms of the top management meetings, it would happen once every six months or a year. It was irregular, and it depended on the schedules of the top people, and it would be adjusted based on that." Samsung SDI 30(b)(6) Deposition of Jaein Lee, Vol. I, 06 June 2012, at 32:15-33:10.
- "[Chunghwa] suggested that weekly meeting shall be called to review price increase status, all makers agreed and set a Meeting at [Chunghwa] Yang Mei factory on 3/27'97 at 9:30 AM, and setup the following dates for future meetings as follows for the time being: [break] 4/2: PH [Philips] Taipei, 4/9: LG, 4/16: Daewoo 4/23: SDD [Samsung] [break] In order to strengthen communication, ensure price increases to succeed smoothly." Chunghwa Picture Tubes, LTD, 19 March 1997, Customer Contact Report, Main Contents 14"/15" CDT Price Opinion Exchange, CHU00028749 - CHU00028751, at 8750E.
- "Review of the implementation method of the Working Level weekly meeting: Each maker indicated that because of the success of Glass Meeting, everybody has been Enjoying Business this year. Now that the Slow Season is coming, everybody should continue to strengthen communications and contacts, so the weekly meetings should continue to be held on time. However, in order to make friendly contacts and strengthen mutual trust, the makers agreed that every 3-4 weeks they would take turns to host a Green

Cartel members also met frequently outside of Glass Meetings, in bilateral meetings, on an *ad hoc* basis.[155] Besides meeting in person, they also communicated regularly by phone and fax.[156]

Meeting (only two members from each maker) after the meeting is over." Chunghwa Picture Tubes, LTD, 09 November 1999, Visitation Report, CHU00030916 - CHU00030918, at 0916.02E.

- "Various makers agreed to change, from now on, to hold Top-Management meeting every 2 months and Working Level Meeting every month." Chunghwa Picture Tubes, LTD, 24 July 2001, Visitation Report (submitted), CHU00036384 - CHU00036385, at 6384.03E.
- "Future GSM [glass meeting] schedule is temporarily set as: a. working level meetings: once quarterly (around the 20th of February, May, August & November) and b. management meeting to be held semi-annually (June and December)." Chunghwa Picture Tubes, LTD, 30 April 2003, CPT market Report (Overseas Trip Report), CHU00123742 - CHU00123745, at 3742.01E.

[154] See, e.g.,

- "Other than to be attended by sales staff for Southeast Asia at the *working level* meetings, the headquarters should also send sales or *marketing* supervisors to attend". Chunghwa Picture Tubes, LTD, 30 April 2003, CPT market Report (Overseas Trip Report), CHU00123742 - CHU00123745, at 42.01E- 42.02E.
- A Glass Working Meeting held on 15 November 2004 was attended by a Branch Manager and Section Chief from LPD, a Branch Manager and Section Chief from Samsung, and untitled participants from Chunghwa. Samsung SDI, 15 November 2004, Report the results of the Glass working meeting on Nov. 15, SDCRT-0090350 - SDCRT-0090353, at 0350E.

[155] See, e.g.,

- Chunghwa Picture Tubes, LTD, 17 May 1996, Sales & Marketing Division Visiting Report, CHU00028809 - CHU00028810.
- Chunghwa Picture Tubes, LTD, 24 May 1996, Sales & Marketing Division Visiting Report, CHU00028968 - CHU00028969.
- Dr. Sommerfeldt, 19 September 1996, re: Meeting with EMEC, SDCRT-0086217 - SDCRT-0086229.
- Samsung, 09 April 1997, Discussion Report of Meeting with MEC, SDCRT-0086230 - SDCRT-0086255, at 6236E.
- Chunghwa Picture Tubes, LTD, 09 April 1998, Visitation Report, CHU00028642 - CHU00028644.
- Chunghwa Picture Tubes, LTD, 14 April 1998, Visitation Report, CHU00028254 - CHU00028256.
- Chunghwa Picture Tubes, LTD, 28 April 1998, Visitation Report, CHU00028647.
- Canavan, Pat, Johnson, Jeff, 15 July 1998, Subject: Visit to Hitachi, PHLP-CRT-081748 - PHLP-CRT-081750, at 1748E - 1750E.
- Kobayashi, Nobuhiko, 05 April 1999, E-mail, Subject: LG Electronics Business trip report ('99.4.2), HDP-CRT00025934 - HDP-CRT0002593, at 5934.
- Nishiyama, Hirozuka, 09 November 1999, Subject: Hitachi CRT, MTPD-0016566 - MTPD-0016567.
- Oh, Kyung Chul, 03 March 2000, Email, Subject: (Resending) Toshiba Flat CPT Offer Situation, SDCRT-0005813, at 5813E.
- Samsung SDI, 07 June 2000, Meetings, SDCRT-0087324 - SDCRT-0087329, at 7326E.
- Watanabe, Genichi, 24 May 2001, E-mail, Subject:HEDUS 32V Price Competiveness - Mexico is Scary, Korea is Scary, HDP-CRT00049291, at 9291E.
- Chunghwa Picture Tubes, LTD, 06 June 2001, Visitation Report (Submit), CHU00031137.

b) The cartel fixed prices

The cartel agreed to fix prices on numerous occasions.[157] A list of documents demonstrating cartel members' agreements to fix prices is in Exhibit 1. I and my staff identified approximately

- Chunghwa Picture Tubes, LTD, 26 June 2001, Sales & Marketing Division Visiting Report, CHU00031141.
- Samsung SDI, 25 October 2001, Toshiba (IN) CPT (Telephone), SDCRT-0087685 - SDCRT-0087686, at 7685E - 7686E.
- Although the document is primarily about a Glass Meeting, it also reports a meeting between Hitachi and Samsung separate from the Glass Meeting. Samsung SDI, 17 December 2001, GSM Meeting, SDCRT-0087437 - SDCRT-0087440, at 7439E.
- Phil PJ Lee, 30 May 2002, Information for SDI and Toshiba, PHLP-CRT-014141 - PHLP-CRT-014143.
- Samsung SDI, 30 July 2002, SDCRT-00877926, SDCRT-0087926 - SDCRT-0087927, at 7926E.
- Iwamoto, Shinichi, 16 August 2002, E-mail, Subject: FW: Information exchange with Thomson, MTPD-0223790 - MTPD-0223792, at 3790E.
- Park, Sung Deok, 20 November 2002, E-mail, Subject: Europe Business Trip Report, SDCRT-0006632 - SDCRT-0006633, at 6633E.
- Samsung SDI, Lee, Jae In, 03 March 2003, E-mail, Subject: Report on Mitsubishi Meeting Result, SDCRT-0006041, at 6041E.

[156] See, e.g.,

- "Director Liu [Chunghwa] made a phone call to [Philips] manager Xiu-Li Lin on the spot and confirmed that [Philips'] price [to AOC] in February was the same as [Chunghwa], and that the order volume was about thousands of units." Chunghwa Picture Tubes, LTD, 20 February 1998, Customer Contact Report, CHU00028955 - CHU00028957, at 8956E.
- From Samsung's meeting notes: "Received other Philips information by fax". Samsung SDI, 18 January 1999, CDT Industry (January 18, '99) Meeting Result, SDCRT-0086557 - SDCRT-0086560, at 6560E.
- "In the event that there are any changes to the line operations plans, such changes should be reported to other companies by fax or other means in advance". Samsung SDI, 19 April 1999, Report on the April 14 Management Meeting Results, SDCRT-0086593 - SDCRT-0086596, at 6593E.
- In an internal e-mail, David Ross of Chunghwa UK states that Leo Mink of Philips called him to confirm production shutdowns and ask for Chunghwa's cooperation. Ross, David, 03 January 2001, E-mail, RE: CPTUK Off-Days (Production Reduction) Plan, CHU00022696, at 2696.01E.
- From meeting notes: "LPD and TSB [Toshiba] believe that it is not necessary to meet so frequently, therefore, it was everyone's suggestion that the meeting would be held in the second month of each quarter in order to discuss current quarter situations as well as the next quarter…[Handwritten:] The regular private communications among each other should proceed continuously." CPT, Yang, Sheng-Jen (S.J.), et al., 21 February 2003, Market Visitation (Glass Meeting) Report (For Submission), CHU00020660, at 0660.02E.
- "No common understanding has been reached whether to reduce prices in the future or not, but it was agreed to increase the number of working level meetings. In the future, any price movement must be communicated by decision makers for prices through meeting or by telephone." Yun, Ling-Yuan (Yvonne), 01 April 2005, General Sales Department Monitor Products Unit, CHU00005997 - CHU00006001, at 5998E.

[157] [redacted]

240 documents related to over 130 meetings during which cartel members agreed to set target prices for one or more CRTs. These meetings spanned most of the class period; the earliest documented meeting that I have found was in May 1995 and the latest in February 2007.[158] The cartel fixed prices for both CPTs and CDTs, including tubes with varying sizes, shapes, finishes, and other characteristics.[159] The cartel fixed prices for tubes made by specific manufacturers,[160] for tubes sold to specific customers,[161] and for tubes bought or sold by anybody.[162]



[158] See, e.g.,

- In May of 1995, LG visited Chunghwa for the explicit purpose of gaining Chunghwa's agreement to a price increase LG and Samsung had discussed. LG reported it was visiting CRT manufacturers in Thailand, Malaysia, and Singapore, having already gotten Toshiba Thailand and Thai CRT to agree (and announce) price increases. Chunghwa Picture Tubes, LTD, 29 May 1995, CPT Sales & Marketing Division Visiting Report, CHU00028933 - CHU00028945, at 8933.01E.
- A Glass Meeting was held on 8 February 2007 with attendees Chunghwa, MTPD, Samsung, and LPD. Jimmy, Wu, and Meng Ying, February 2007, Market Visitation Report (Glass Meeting), CHU00030437 - CHU00030438, at 0437.01E.

[159] See, e.g.,

- Chunghwa Picture Tubes, LTD, 26 September 1998, Visitation Report, Topic: 14"/20"/21" CPT Supply/Demand and Price Comment Review, CHU00029262 - CHU00029264.
- Chunghwa Picture Tubes, LTD, 29 June 2001, Agenda, CHU00660395 - CHU00660407.
- Chunghwa Picture Tubes, LTD, June 2003, CDT Market Report, CHU00660217 - CHU00660220.
- MT Picture Display, 06 May 2004, SML Meeting, MTPD-0580751.

[160] See, e.g.,

- Chunghwa Picture Tubes, LTD, 20 May 1997, Customer Contact Report, Main Content 14"/15" CDT Price Discussion, CHU00028725 - CHU00028727.
- Hsieh, Chun-Mei (Christina), 13 October 1999, Contact Report, Meeting Topic: CDT Regular Exchange Meeting, CHU00030888 - CHU00030893.
- Kim, LJ, 26 January 2001, England0101, SDCRT-0087662 - SDCRT-0087663.

Target prices can be found in the text of meeting notes documents or in formal tables included in these documents. Meeting notes reference agreements to increase price,[163] to set price differentials,[164] to maintain current prices,[165] or to coordinate price reductions.[166] The notes also show cartel members discussing when to send price increase letters to customers.[167] Target price tables included in meeting documents sometimes show past target prices[168] or future target prices.[169] Tables are also frequently used to present price differentials, either alone[170] or alongside the base target prices.[171] In general, target prices can be classified in one of three ways:

- Samsung SDI, 21 November 2003, Schiphol Meeting, SDCRT-0088635 - SDCRT-00886660.

[161] See, e.g.,

- Du, Ching-Yuan (Michael), 28 January 1997, Customer Contact Report, CHU00028768 - CHU00028770.
- Chunghwa Picture Tubes, LTD, 27 October 1999, Visitation Report, Topic: Exchange of Market Information and Price Review, CHU00029171 - CHU00029174.
- Chunghwa Picture Tubes, LTD, 04 January 2002, Visitation Report, CHU00031176.
- 26 September 2005, MTPD-0423645, MTPD-0423645.

[162] See, e.g.

- Chunghwa Picture Tubes, LTD, 12 March 1997, Customer Contact Report, CHU00028758 - CHU00028759.
- Samsung SDI, 06 December 2002, 3 Companies MTG Information (5th) - Result Report, SDCRT-0087934 - SDCRT-0087937.
- Chunghwa Picture Tubes, LTD, April 2004, Time Schedule, CHU00660681 - CHU00660692.
- Samsung SDI, 05 August 2005, CPT Meeting Result Report (August), SDCRT-0091382 - SDCRT-0091383.

[163] Chunghwa Picture Tubes, LTD, 23 July 2004, Overseas Trip Report, CHU00123393 - CHU00123403, at 3396E.

[164] Samsung SDI, 23 June 1999, Report on the results of the 5 CDT companies' management meeting (June 23), SDCRT-0086641 - SDCRT-0086645, at 6644E.

[165] Chunghwa Picture Tubes, LTD, 07 November 2003, Market Visitation Report (Glass Meeting), CHU00030071 - CHU00030093 at 0073.03E.

[166] Chunghwa Picture Tubes, LTD, 21 December 2001, Visitation Report (Submitted), CHU00036406 - CHU00036407, at 6407E.

[167] Chunghwa Picture Tubes, LTD, 10 May 1999, Business Meeting Report, CHU00036378 - CHU00036380, at 6378.01E.

[168] Samsung SDI, 25 April 2003, Glass Result Report, SDCRT-0088713 - SDCRT-0088714, at 8714E.

[169] Chunghwa Picture Tubes, LTD, 01 October 1998, VISITATION REPORT, CHU00030670 - CHU00030674, at 0673.02E – 0674.01E.

[170] Chunghwa Picture Tubes, LTD, 25 March 2004, Return-from-Abroad Trip Report, CHU00031240 - CHU00031247, at 1240.

[171] Chunghwa Picture Tubes, LTD, 29 April 2005, Market Visitation Report (Glass Meeting), CHU00030497 - CHU00030498 at 0498E.

a maintenance price (i.e., keep at current $X),[172] a bottom price (i.e., do not charge below $X),[173] or a guideline price (i.e., charge $X).[174]

Defendants' contemporaneous business documents suggest the cartel members did not always raise prices to the full extent that they had agreed upon.[175] As described in Section VII, some "cheating" on the cartel's agreed-upon pricing does not in itself indicate that the observed prices are competitive. In fact, some cheating may be expected and part of the normal functioning of a successful cartel.[176] A cartel member may set its price below the target price but above the competitive price, thereby harming the direct purchaser.

c) The cartel imposed output and capacity restrictions

The cartel agreed to restrict CRT output and capacity on numerous occasions. Exhibit 28 lists dozens of meetings during which cartel members agreed to reduce output and/or capacity. Many of these agreements applied to CDT production, although there were at least ten instances in which cartel members agreed to reduce output or capacity of CPTs. During the early years of the class period, these agreements were for the temporary shutdown of particular production lines for a fixed period of time; the effect of temporarily shutting down production lines was to reduce output during the time lines were not operating, thereby raising price.[177]

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[172] Chunghwa Picture Tubes, LTD, 08 September 2003, CPT Glass Meeting Result Report, SDCRT-0088732 - SDCRT-0088733, at 3.

[173] Chunghwa Picture Tubes, LTD, 12 March 1997, Customer Contact Report, CHU00028758 - CHU00028759, at 8759E.

[174] Samsung SDI, 25 April 2003, Glass Result Report, SDCRT-0088713 - SDCRT-0088714, at 8714E.

[175] [redacted]

[176] "Thus, we demonstrate that deliberate and unpunished price cuts and business stealing (which would appear to observers as 'cheating') can be critical to the healthy functioning of a cartel." Bernheim, B. Douglas and Madson, Erik, March 2014, Price Cutting and Business Stealing in Imperfect Cartels, NBER Working Paper Series 19993, at 6.

[177] See, e.g.,

- Meeting notes have attached production control tables: "3. Respective makers to reduce production days in order to control output quantity. [break] 4. In order to maintain original M/S [market share] as a principle, respective makers must not use the opportunity to acquire original delivery volume of other makers due to price increase. [break] Remark: SDD [Samsung] provided production control table for all makers is hereby copied, revised and attached as an appendix." Table contains worldwide CDT production volumes. Chunghwa Picture Tubes, LTD, 25 February 1997, Customer Contact Report, CHU00028760 - CHU00028766, at 8760.02E - 8762E.
- "Reached an agreement to reduce the production of 17" CDT [Bullet] Factory operation to be adjusted first to stabilize the price [Arrow] 3/4 quarter capacity: 5.5 million units, actual production: agreed to reduce to 3.9 million units, reached a 25% prod. reduction. [Bullet] Also, companies agreed to reduce production by further 4% in order to maintain the price 17" screens at US$ 93." Samsung SDI, 31 July 1998, 8th CDT Industry Meeting (July 31) Results, SDCRT-0086419 - SDCRT-0086420, at 6419E.
- "[Bullet] Up to now, the capacity adjustment for 17" CDT's has been proceeding smoothly as a result of cooperation among the companies. [Bullet] In June, 17" CDT production will stop for 5 days (25 operating days) to adjust the actual production volume in order to maintain the price level." Samsung SDI, May 1999,

Over the period 2001-2005, the cartel agreed to specific reductions in production capacity, going beyond their earlier practice of agreeing to specified numbers of idle days per month and agreeing to long-term shutdowns of production lines. The agreed capacity reductions were substantially implemented; see Exhibit 29.

The effect of long-term and permanent shutdowns of lines was to reduce cartel members' ability to produce output, which raised price and reduced cartel members' ability to cheat on cartel prices and output. The cartel was explicit that the motivation for the agreed capacity reductions was to increase price.[178]

d) The cartel shared plans and information

Cartel members shared a wealth of information with each other relevant to the business of price fixing. They shared projections of demand,[179] current capacity,[180] projected capacity,[181] and

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Report on the CDT management meeting results (May of '99), SDCRT-0086632 - SDCRT-0086633, at 6632E.

- "(E) Working Day Reduction: Nov '00 Resolution: [para.] The market demand in November is worse compared to October, in order to maintain the stability of pricing, a stricter control of the output volume is needed. Thus, the shutdown days for 15"/17" production line should be increased to 9 days from 7 days in October." Chunghwa Picture Tubes, LTD, 25 October 2000, Visit Report, CHU00031075 - CHU00031087, at 1076.01E.
- "In order to maintain pricing of 13V in Europe, and to smooth out the 20V price increase implemented by PH/SDI [Philips/Samsung], PH proposed to have each of the 13 V manufacturers reduce workdays in 1Q in order to control inventory. PH (Spain plant) has decided to change the 7 days per week production to be closed on every weekend to hold off production. PH is also requesting [Chunghwa] and Orion to decrease production simultaneously and inform them of the dates when productions are to be held-off...While the pricing of 13V is not out of control yet in Europe, shall we accommodate the PH's request and provide them with the dates of planned production reduction (in principle, we will hold off production for same amount of days as PH)." Ross, David, 03 January 2001, E-mail, RE: CPTUK Off-Days (Production Reduction) Plan, CHU00022696, at 2696.01E.
- "(E) Line Stoppage Days for April Each maker reported on the number of days of downtime planned: [Chunghwa] - 14 days, Philips - 14 days, LG - 14 days, and SDI [Samsung] - 12 days. The final resolution is to have 14 days of downtime for the month of April. As for Orion, it still needs further confirmation before giving a reply." Chunghwa Picture Tubes, LTD, 19 March 2001, Visitation Report (Submit), CHU00031111 - CHU00031112, at 1112.02E.

[178] See, e.g.,

- June 2001: "to effectively decrease capacity and control prices". Chunghwa Picture Tubes, LTD, 27 June 2001, Visitation Report, CHU00660306 - CHU00660311, at 0309E - 3010E.
- July 2001: "The goal is … to prevent price drops caused by oversupply." Tomoyuki Kawano, 04 July 2001, E-mail, Re: Taiwan Competitor Bulletin (Destroy After Reading), TSB-CRT-00035348 - TSB-CRT-00035349, at 5349E.
- December 2002: "How to Keep the Price [first bullet] 20% capacity shutdown of 3 makers". Chunghwa Picture Tubes, LTD, 27 December 2002, Itinerary, CHU00660487 - CHU00660500, at 0497.

[179] See, e.g.,

- A Contact Report between Samsung and Chunghwa includes a global CDT demand projection of 87.2 million in 1998. Chunghwa Picture Tubes, LTD, 11 November 1997, Customer Contact Report, CHU00028685 - CHU00028686, at 8686E.

- From meeting notes: "The demand for small/medium sizes [of CPTs] in Europe and the U.S. is pretty good but customers said it will become soft from October and it will drop 20% from November. The demand in Asia Pacific Region will remain strong until year end. However those customers who are the large-scale OEM orders, demand is expected to drop starting in November. Currently the delivery of 14" tubes is tighter than 20"/21" and based on current Q4 overall customer order prediction and output estimates (more holidays during year-end for Malaysia's NewYear/Christmas)." Chunghwa Picture Tubes, LTD, 22 August 2000, Visitation Report, Topic: Market Information Exchange and Price Review, CHU00029105 - CHU00029107, at 9107.01E.
- From meeting notes: "There is no unanimity on views of market demand among the makers. The final conclusion: according to the latest report in March from IDC, Desktop PC still has 8.7% growth in '01 when compared to '00, therefore, CDT demand is optimistically forecast to reach 118 Mpcs. However, the overall demand is in a slump, especially when recession continues in the U.S. market and has yet to see any sign of improvement in Q2. So the CDT demand for the entire year is pessimistically forecast at only 114 Mpcs." Chunghwa Picture Tubes, LTD, 19 March 2001, Visitation Report (Submit), CHU00031111 - CHU00031112, at 1112.02E.
- A meeting report shows an LPD and Toshiba global demand forecast of 165 million CPTs in 2002 and a Samsung forecast of 156 million CPTs. Samsung SDI, 06 December 2002, 3 Companies MTG Information (5th) - Result Report, SDCRT-0087934 - SDCRT-0087937, at 7936E.
- A Glass Meeting report shows a forecast of CDT demand in the second half of 2005. Samsung SDI, 04 July 2005, G/S MTG Result Report, SDCRT-0091656 - SDCRT-0091659, at 1658E.

[180] See, e.g.,

- Meeting notes include CDT and CPT capacity information for SDD, LG, and Orion. CPT, 17 March 1995, 3/17 - 3/18 CRT Manufacturers Meeting, CHU00028565 - CHU00028566, at 8565E - 8566E.
- Meeting notes include CPT capacity information for Chunghwa, LG, Orion, Samsung, Thai-CRT, and Toshiba in 1st and 2nd Quarter 1999. 07 March 1999, Malay Meeting on Mar 07, CHU00029248 - CHU00029258, at 9253.
- A Glass Meeting presentation includes CPT capacity information for Samsung, LPD, Chunghwa, and Orion in 2nd Quarter and 3rd Quarter 2002. 28 May 2002, Glass Meeting, SDCRT-0007588 - SDCRT-0007594, at 7590-7591.
- A Glass Meeting report includes CPT capacity information for MTPD, Samsung, LPD, Thai-CRT, and Chunghwa in 2nd Quarter and 3rd Quarter 2004. Chunghwa Picture Tubes, LTD, 18 May 2004, Market Visitation Report (Glass Meeting), CHU00124024 - CHU00124031, at 4024.01E.
- A meeting agenda includes current CDT capacity for Samsung, LPD, and Chunghwa. Samsung SDI, 13 March 2006, Main Discussion Agenda, SDCRT-0091715 - SDCRT-0091718, at 1716E.

[181] See, e.g.,

- Notes from a 1999 meeting include projected small and medium CPT capacity for Chunghwa, LG, Orion, Samsung, Thai-CRT, and Toshiba in 1st Quarter 2000. Chunghwa Picture Tubes, LTD, 21 September 1999, Visitation Report, CHU00029175 - CHU00029178, at 9177E.
- A 1999 Glass Meeting presentation includes projected CDT capacity information for Chunghwa, LG, Orion, Philips, and Samsung in the year 2000. Chunghwa Picture Tubes, LTD, 20 September 1999, Visitation Report (Submit), CHU00030855 - CHU00030868, at 0863E.
- Meeting notes include forecasted capacity changes for Philips, Thomson, Samsung Germany, and Daewoo. Kim, Lak Jin, 17 May 2001, Meeting Result Report, SDCRT-0087667 - SDCRT-0087669, at 7668E.
- A 2002 Top Meeting presentation includes projected CDT capacity information for 2003, assuming line shutdowns at Sony and Toshiba and after a 20% shutdown of lines at Chunghwa, LPD, and Samsung. November 2002, Itinerary, CHU00660501 - CHU00660514, at 0506-0508.

projections of excess supply.[182] Identifying situations where excess supply was expected helped the cartel to anticipate conditions in which price erosion was likely to occur, and to prepare for those conditions. For example, if the cartel expected excess supply, it could prepare by shutting down production lines to prevent price from falling. See Sections VIII.A.1.b) and VIII.A.3.c).

Cartel members also shared information with each other regarding their negotiations with customers, including the names of customers to whom they were selling and with whom they were in negotiations, the products they were selling, their quantities, and their prices.[183]

- Notes from a 2002 meeting include projected capacity for 14", 20", and 21" CPTs in 1st Quarter 2003 for Chunghwa, Thai-CRT, Toshiba, Samsung, and LPD, as well as projected global capacity for each quarter of 2003. Chunghwa Picture Tubes, LTD, 17 December 2002, Market Visitation Report, CHU00030559 - CHU00030562, at 0559.01E.

[182] See, e.g.,

- In a section titled "Opinion Exchange regarding '95/'96 W/W [Worldwide] CDT Supply/Demand" from a Contact Report between Samsung and Chunghwa: "Both sides reached a common understanding with regard to supply exceeding demand starting in the second half of 1996 (especially for 17")." Chunghwa Picture Tubes, LTD, 18 September 1995, Customer Contact Report, CHU00028865 - CHU00028867, at 8866E.
- A Contact Report between Samsung and Chunghwa includes a global CDT supply and demand forecast which predicts a 21% oversupply situation in 1997 and a 13% oversupply situation in 1998. Chunghwa Picture Tubes, LTD, 11 November 1997, Customer Contact Report, CHU00028685 - CHU00028686, at 8686E.
- Glass Meeting materials from 1999 contain a supply-demand comparison for 2000 based on Philips' demand forecast. Global CDT capacity is 149,428,000 while global CDT demand is 105,300,000, which represents an oversupply of 42%. Chunghwa Picture Tubes, LTD, 20 September 1999, Visitation Report (Submit), CHU00030855 - CHU00030868, at 8865E.
- A presentation from a 2002 Top Meeting has a capacity scenario page which shows a CDT oversupply situation of 22% in 2002 and 28% in 2003. November 2002, Itinerary, CHU00660501 - CHU00660514, at 0506-0507.
- "In the long run, the market will still be oversupplied as a result of the shrinking demands for small sizes [of CPTs]." Chunghwa Picture Tubes, LTD, 25 May 2006, Visitation Report, CHU00036398 - CHU00036401, at 6498.02E.

[183] See, e.g.,

- Meeting notes show Chunghwa and Samsung compared current 14" and 15" CDT selling price for specific customers (e.g., ACER, ADI, Lite-on). Samsung also shared its October sales volume. Chunghwa Picture Tubes, LTD, 30 October 1997, Customer Contact Report, Main Content 14"/15" CDT Price Discussion, CHU00028687 - CHU00028688, at 8688E.
- Meeting notes from a Europe Glass Meeting include a 14" CPT price comparison (current and planned) of Philips, Chunghwa, Orion, and Samsung regarding specific customers (e.g., MIVAR, Matsushita), as well as sales information (e.g., Philips supplying 20K to Vestel in 2000). Samsung SDI, 11 November 1999, Europe Glass Meeting, SDCRT-0086512 - SDCRT-0086513, at 6512E-6513E.
- Meeting notes include a sales forecast for Philips, Thomson, Daewoo, and Samsung Germany in May 2001 by specific customer, as well as a review of prices by product (e.g., Philips 21" CPT) and specific customer (e.g., BEKO, Sanyo, and MIVAR). Kim, Lak Jin, 17 May 2001, Meeting Result Report, SDCRT-0087667 - SDCRT-0087669, at 1-2.
- Glass Meeting notes include the second quarter 2004 sales of MTPD, Samsung, LPD, Thai-CRT, and Chunghwa, as well as a review of their current 14" CPT prices to specific customers (e.g., Funai, JVC,

Cartel members shared information regarding their plans for the introduction of new products.[184] Cartel members found that the exchange of information reduced competition.[185]

Sanyo) and their future asking prices. Chunghwa Picture Tubes, LTD, 18 June 2004, Marketing Visitation Report (Glass Meeting), CHU00030526 - CHU00030529, at 0526.01E-0528.01E.

- A meeting presentation includes CDT sales of Chunghwa, LPD, and Samsung for first quarter 2005, as well as price information for specific customers (e.g., Samsung, LGE, AOC) by supplier. Samsung, 26 April 2005, Agenda, SDCRT-0091634 - SDCRT-0091639, at 1635-1638.

[184] See, e.g.,

- From meeting notes between Chunghwa and Philips: "After the meeting, Jim talked to me alone and expressed that the expectation for next year's market is not as good as for this year but the [Chunghwa] production, on the contrary, will increase from 3M this year to 4 M, which will cause big impact on the market. Accordingly, he hoped [Chunghwa] could have a second thought. I said that [Chunghwa] didn't intend to disturb the market and it is a sincere gesture to limit itself from taking orders from customers which have conflicting interests or to inform PH [Philips] first before taking orders. Besides, the growth in quantity this year is mostly from [Chunghwa's] original own customers and [Chunghwa] didn't fight for orders viciously against PH. Next year, [Chunghwa] will introduce 15" flat tube but the impact should not be too big. Jim still hopes [Chunghwa] can control the production quantity." Chunghwa Picture Tubes, LTD, 23 June 2000, Visitation Report, Topic: TV Tube Market, CHU00029110 - CHU00029115, at 9112.01E.
- A meeting notes document talks about the schedule for each company's introduction of 21" PF (pure flat, with an iron mask) in 2004 and 2005, which has been led by MTPD. MT Picture Display, 17 September 2004, CRT Industry Meeting, MTPD-0580795, at 0795.
- From meeting notes between LPD and MTPD: "Both the parties have exchanged CRT product roadmaps including information of slim tubes of LPD and D-com, D-sup concepts of MTPD." Engelsen, Daniel den, Brouwer, Wim, et al., 06 December 2004, Visit Report to MTPD in Takatsuki, PHLP-CRT-027718 - PHLP-CRT-027721, at 7720.
- From meeting notes between Chunghwa and Thai-CRT: "Therefore, Thai CRT was aggressively developing 15"RF [real flat]. Although the plan is to have mass production after Q3, it was quoting low prices everywhere. From what we have heard, it has quoted Usd 28.0 to our main customer Orion [Underlined by hand], increasing the pressure on us to drop price with Orion. Therefore, we must accelerate speed in bringing out our 15"RF A/K tube so that we can maintain and strive for orders with the support of competitiveness in cost." Chunghwa Picture Tubes, LTD, 27 May 2005, Foreign Business Trip Report, CHU00732798 - CHU00732899, at 2899.01E-2899.02E.
- From Glass Meeting notes: "Both SDI (C) [Samsung China] and BMCC projected to mass produce 21" super slim [Underlined by hand] in October this year; LPD(I) [LPD Indonesia] [Underlined by hand] also projected mass production in Q1 next year." Chen, Hwang-Yun (Henry), Chen, Mu-Lin (Jimmy), 22 September 2005, Market Visitation Report (Glass Meeting), CHU00030472 - CHU00030473, at 0473.01E.

[185] See, e.g.,

- "Q. Based on your background and experience, did you find the one-on-one meetings helpful in avoiding vicious competition? [objections omitted] THE WITNESS: Sometimes. BY MR. VARANINI: Q. And with respect to the glass meetings themselves, I believe you testified earlier that you exchanged demand and supply information; is that correct? [objection omitted] THE WITNESS: Correct. BY MR. VARANINI: Q. And was that also helpful in avoiding vicious competition? [objection omitted] THE WITNESS: Correct." 26 February 2013, Deposition of Sheng-Jen Yang, Volume III (Hereinafter "Deposition of Sheng-Jen Yang, Vol. III, 26 February 2013"), at 391:4 - 391:22.
- "Q. Did you use the competitor information in the creation of both the sales and the business plans? A. I did use it as – I did refer to it when conducting the supply and demand analysis but I did not use it directly.

e) The cartel established monitoring and enforcement procedures

The cartel monitored compliance with temporary line shutdowns by sending representatives of the cartel on site visits to verify that production had halted.[186] Defendants provided the names of

Q. And did you use the supply and demand analysis in both the sales plans you created and the business plans that you created? A. Yes." Hitachi 30(b)(6) Deposition of Nobuhiko Kobayashi, Vol. I, 17 July 2012, at 96:16 - 96:24.

- "Q. In addition to exchanging CRT price information, was production information exchanged? A. Yes, that is what I recall. Q. Was capacity information exchanged? A. Yes, that is what I recall. Q. What was the purpose of this information exchange with Toshiba? [objection omitted] THE WITNESS: As I said earlier, this was done. I used this in order to gain a deeper understanding of the CRT industry, the market... Q. Would the combination of all of this information that you would receive, this market information, the type that was being exchanged between you and Toshiba and you and Hitachi, would that help you make business decisions in terms of CRTs? [objections omitted] THE WITNESS: I think I said this earlier as well, but the information from Toshiba was one piece of information. And I gained – I received information from a lot of different sources, from suppliers, customers, research companies, et cetera, et cetera, and so this was but one of them." 05 March 2013, Deposition of Hirokazu Nishiyama, Volume I (Hereinafter "Deposition of Hirokazu Nishiyama, Vol. I, 05 March 2013"), at 169:19 - 173:2.
- "Q. What was the purpose of exchanging North American CRT production information with Thomson in this 2002 to '06 time period we talked about this morning? [objection omitted] THE WITNESS: One of the objectives was that I wanted to know what the production capacity for each of the North American CRT plants were. BY MR. LAMBRINOS: Q. Why did you want to know that? A. If it's possible to get a sense of the overall capacity since the demand has been – since we were informed of the demand by the customers, it would be possible to see the relationship between supply and demand. Q. When you see the relationship between supply and demand, how does that help you run your CRT business? [objection omitted] THE WITNESS: First, it would be possible to get a sense of what type of demand there is in the market when introducing a new product. BY MR. LAMBRINOS: Q. Second? A. Second, it's also possible to make a projection of how the CRT prices would move in general by understanding the relationship between the supply and the demand." 07 February 2013, Deposition of Shinichi Iwamoto, Volume I (Hereinafter "Deposition of Shinichi Iwamoto, Vol. I, 07 February 2013"), at 69:13 - 70:15.
- [redacted].

[186] See, e.g.,

- Notes from a management meeting detail the monitoring of Samsung's Busan and Suwon factories by Chunghwa and Orion and the monitoring of Chunghwa's Malaysian factory by Samsung. Samsung's instructions for its inspectors are: "It should be confirmed whether the #5 line is operating. The line should be checked twice, in the morning and in the afternoon. Please transmit the monitoring results via Single." The notes also indicate that Chunghwa and Orion monitored LG's Gumi and Changwon factories for nonoperation on April 17 and 18, and LG monitored Orion's factory for nonoperation on April 18. Samsung SDI, 19 April 1999, Report on the April 14 Management Meeting Results, SDCRT-0086593 - SDCRT-0086596, at 6596E.

the auditors they intended to send to other companies at meetings, and designated "principal" and "supporting" auditors for each company.[187] Cartel members also created "audit plans" and submitted them to the cartel.[188]

- From CDT meeting notes: "Results of the monitoring of Philips' Dapon factory [list format] 1) Date: June 24, '99 […] 2) Item: #5 line in the Dapon factory […] 3) Result: #1, 19", #5 17" lines not operating." Samsung SDI, 23 June 1999, Report on the results of the 5 CDT companies' management meeting (June 23), SDCRT-0086641 - SDCRT-0086645, at 6643E.
- Report meeting notes document: "1. The purpose of this trip is to AUDIT LINE 2 at SSDD's [Shenzhen Samsung Display Devices] Shenzhen factory to see if it has shut down 17"CDT production according to agreement. [...] 3. After obtaining permission from SSDD, I CHECKed [sic] their production line on 4/9 and 4/10, its original tube, coating, sealing, exhaust gas, lTC, etc. manufacturing process and found that LINE#2 only produced 14" CDT." Chunghwa Picture Tubes, LTD, 09 April 2000, Visitation Report, CHU00030998, at 0998E.
- From CDT meeting notes: "(A) Follow-up of last meeting: Audit Control: [Chunghwa] reflected the Audit of the shutdown situation on 10/8 in LG Wales factory, [Chunghwa] people found that LG had not implemented shutdown according to the original plan. Mr. Choi of LG replied that they will investigate and respond, but LG has shut down for over 8 days due to the bad order condition this month." Chunghwa Picture Tubes, LTD, 25 October 2000, Visit Report, CHU00031075 - CHU00031102.

[187] See, e.g.,

- From a meeting document and handwritten notes: "Auditor names from [Chunghwa], LPD, SDI (Bruce Lu, Eddie MEI from [Chunghwa]; JH Oh, JS Kim from LPD; Jay Jeong and JH Choi from SDI)." Samsung, 21 October 2004, SDCRT-0090233, SDCRT-0090233, at 122.
- An e-mail from JK Cesar Jung, Key Account Manager at LG.Philips Displays, discusses a meeting where auditors would be selected to check on production line shutdowns: "Dears, [...] As already informed, the meeting will be held on [sic] 2 pm ~ tomorrow. The following will be discussed [...] 2. Line shut-down [bullet] prepare the name list of the auditor (2 people) [bullet] relevant audit will be arranged as of Dec/end." Song, Inhwan, 28 December 2004, E-mail, Subject: Fwd: RE: [Dec 29th] Working level meeting -----> from 15:30, CHU00735283 - CHU00735286, at 5284.
- A meeting notes document contains a table of auditor names by company as well as another table indicating which cartel members were "principal" and "supporter" inspectors for each manufacturing plant. Chunghwa Picture Tubes, LTD, 29 December 2004, Sales Headquarters Display products Sales Department CDT Market Report, CHU00126131 - CHU00126136, at 6132E-6133E.
- In a capacity control discussion from meeting notes: "They agreed to a Line Audit by 2 people having Free Pass, without prior notice at each company." Samsung SDI, 19 January 2005, G/S MTG Result Report, SDCRT-0091599 - SDCRT-0091604, at 1602E.

[188] See, e.g.,

- Meeting notes have a production control and auditing plan for the 17" CMT [CDT] in May 1999 for Chunghwa, SDD, LG, Orion, and Philips. Chunghwa Picture Tubes, LTD, 12 May 1999, Contact Report, CHU00030757 - CHU00030762, at 0762E.
- "Ultimately, a resolution was reached by everyone that a minimum of seven days stoppage will be implemented in August. In addition, as for LG's combined line of 15" and 17", meeting attendees all expressed objections that as production days of 15" can be converted as 17" stoppage days, LG was asked to review and make improvement. Meeting attendees resolved that each company shall report its production stoppage and Audit plans on the weekly meeting to be held on 7/28." Chunghwa Picture Tubes, LTD, 23 July 1999, Visitation Report, Topic: CDT Market Information Exchange and Price/Production Volume Review, CHU00030809 - CHU00030814, at 0810.01E - 0810.02E.

The cartel monitored its agreements to fix price and restrict quantity.

Cartel members also received feedback from customers about the prices being offered by other cartel members. When information received from these two sources was in conflict, cartel members challenged each other in cartel meetings.[189] The cartel threatened cheaters with

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- "C) 17"CDT stoppage days of various makers' production lines in August: Various makers reported the number of stoppage days as shown in the attachment. They needed to verify Audit plans and send them to PH for compilation before Friday. Also, makers need to notify visiting/hosting staff and specify time of plant visit two days before Audit." Chunghwa Picture Tubes, LTD, 28 July 1999, Visitation Report, CHU00030807 - CHU00030815, at 0808.01E.
- "Meeting attendees agreed that, in order to effectively ensure price level, 17" tube production shutdown period needs to be at least 5 days in September. Each maker will provide a production stoppage plan before 8/24, and complete Audit plans for related factory zone before 8/28." Chunghwa Picture Tubes, LTD, 20 August 1999, Visitation Report, CHU00030835 - CHU00030843, at 0837E.
- Meeting notes have attached line-stoppage and audit plans: "Each make's reported line-stoppage and Audit plan is attached. It was agreed that two days prior to the Audit date, the makers should notify one another of the visitors/hosts. The actual time to factory, then, does not need to be verified. Mr. Ha indicated that the makers needed to implement an actual Audit. He also made a simple record to facilitate reports from Management meeting." Chunghwa Picture Tubes, LTD, 27 September 2000, Visitation Report (Submit), CHU00031067 - CHU00031073, at 1067.02E-1069E.

[189] See, e.g.,

- "President Lin [from Chunghwa] indicated that after the *Top Level* reached a conclusion regarding the price issue, the *Working Level* personnel should actually *Review* the market price situation at each meeting, and if abnormality appears, then they should find out the real price. The saboteur will be questioned thoroughly. The matter will then be reviewed at the *Top* meeting to seek a solution." Hsieh, Chun-Mei (Christina), 13 October 1999, Contact Report, Meeting Topic: CDT Regular Exchange Meeting, CHU00030888 - CHU00030893, at 0890E.
- "As to our question that SDI [Samsung] is Offering Thomson a lower price in order to grab orders (200k for the first half of 2001), SDI responded that its price remains at $25.5. Although those on the front line window believe that price should be lowered, upper management has yet to authorize such a move. Based on the request from Thomson, a price decision should be made within 1 week." Chunghwa Picture Tubes, LTD, 21 December 2001, Visitation Report (Submitted), CHU00036406 - CHU00036407, at 6406.02E.
- "SDI [Samsung] flatly denied our suspicion that it has offered Sharp-Spain with prices as low as (ITC EU$34=U$23). We explained that considering manufacturing cost in Europe factories, such low prices should not have been offered in EU market. However, it admitted that its upper management offered Thomson $24.2 in first quarter in order to grab orders with low price, but they later increased its 10" price to balance it out after consideration. CPT stressed that such a practice is wrong and CPT's share at Thomson cannot be grabbed by SDI." 22 February 2002, Visitation Report, CHU00036394 - CHU00036395, at 6395.01E.
- "First of all, LPD questioned the announced total sales volume of SDI [Samsung] and its somewhat concealment on its deliveries made to SEC and Proview, since there are significant differences from the data obtained by LPD. It tried to switch focus and complained that the agreed upon market share ratio by the three makers are unrealistic; followed by attacking SDI is secretly causing trouble with AOC. Actual delivery in June and July is far higher than the data announced." Yun, Ling-Yuan, 21 July 2003, CDT Market Review, CHU00005963, at 5963.01E.
- "When it was mentioned that the agreed price of the three companies was violated, there was no notice to our company while starting business to Proview, and our company sought the understanding of both companies when starting with Philips, Lite-On Biz and so on, they said that they would talk again to the head office. However, when our company denies this by saying, 'Is it not $43.5 that is our company's price

punishment in the form of price competition from the cartel.[190] The cartel's monitoring and punishment efforts induced cheaters to comply with cartel policies on at least several occasions.[191]

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of Proview', they then requested confirmation once again." Samsung SDI, 15 November 2004, Report the results of the Glass working meeting on Nov. 15, SDCRT-0090350 - SDCRT-0090353, at 0351E.

- "During the meeting, we objected to LPD's lowering its prices to AOC secretively, reporting a lower-than-actual shipment volume and eroding our market shares, LPD's only response was to deny." Chunghwa Picture Tubes, LTD, 29 March 2005, CDT Market Report, CHU00014202 - CHU00014206, at 4203E.

[190] See, e.g.,

- "14" CDT, under the circumstances such that the market as a whole has not tended toward worsening, [Chunghwa] still maintains its original selling price foundation to all its customers. Even Mag/Delta, etc., who are eager to get into exports, also conform to original foundation quotes. Requested that TSB [Toshiba] understand, and not be misled by its customers, maintaining 14" selling price together. But if the 14" price war really begins, TSB should understand that [Chunghwa] has the best capabilities to respond accordingly. At that time, TSB 14" CDT operations will be even more difficult." CPT, Du, Ching-Yuan (Michael), 17 June 1996, Customer Contact Report, CHU00028297 - CHU00028298, at 8297E.
- "PH [Philips] commented that if SDD [Samsung] continued to disrupt the 14" market, there is no guarantee that it will follow rules with the 15"/17". If SDD's misconduct is not corrected, PH would be forced to take drastic actions under the pressure of high inventory." Chunghwa Picture Tubes, LTD, 13 January 1999, Visitation Report, CHU00030698 - CHU00030700, at 0698.03E.
- LPD proposal: "Penalty if company cheat prices (1) Person in charge & manager will be dispelled [sic] (2) Other 2 company [sic] will attack trouble maker's major customer." Samsung SDI, 2002, SDCRT-0087953, SDCRT-0087953 - SDCRT-0087962, at 7953E.
- "SDI's M/S [market share] for SEC changed from Q1/85% --> Q2/80%, September only has 70% or so. If [Chunghwa] does not cooperate, then SDI has to lower the price for SEC, or to fight for share in AOC or L-On." CPT, 24 August 2005, Letter head: Hongxi Creek Resort Ta Shee Resort, CHU00017115, at 2.

[191] See, e.g.,

- "Director Liu said that SDD's use of bottom price had caused harm to [Chunghwa]. He asked SDD to find a way to remedy. For example, at present, regarding Acer, the greatest harm, Director Liu asked him to raise the price to USD64.00/pc or restrict its supply volume on the ground that the output was not smooth. Mr. Lee claimed that it was Mr. Park at its Malaysia plant who had quoted to Acer USD 60.00/pc for 14". Although it does not violate its policy, he would try to find out whether there would be remedial measures, and would discuss this matter again at the formal meeting at 5:00 PM on 2/25'97." Chunghwa Picture Tubes, LTD, 24 February 1997, Customer Contact Report, Contents Exchange of Opinions Regarding 14" CDT Price, CHU00028763 - CHU00028767, at 8764E.
- "Regarding LG's offer of less than $93 for 17" screens [bullet] LG asserted that the offer below $93 is a rumor and agreed not to offer below $93 in the future." Samsung SDI, 31 July 1998, 8th CDT Industry Meeting (July 31) Results, SDCRT-0086419 - SDCRT-0086420, at 6420E.
- "Director Liu explained that although LG still has some under the table conduct, but being under the supervision by everyone, they are being pushed towards making most offer at the agreed bottom price." CPT, Liu, et al., 25 August 1998, Sales Department Customer Contact Report, CHU00028463 - CHU00028464, at 8464E.
- "[Chunghwa] complained of efforts by SDI to grab orders for Thomson 14" by lowering prices, growing from 3-5K/M to 30K/M. In defense, SDI said its quoted price is $25.5 sold jointly with 10" and that although the customer had requested a price reduction, that has not been approved. [Chunghwa] questioned that SDI's increase in orders was already a fact and had a clear impact on [Chunghwa] deliveries. Finally, SDI indicated that it plans to reconfirm the sales prices and make a report at the next meeting. If low

f) The cartel allocated customers to suppliers

The cartel divided the market using two schemes. Major customers were allocated to cartel members, a primary supplier and one or more secondary suppliers.[192] Primary suppliers' prices were fixed by the cartel at levels slightly below the prices set by the cartel for secondary suppliers.[193] The differential between the primary and secondary suppliers' prices induced customers to make a larger share of their purchases from primary suppliers than from secondary suppliers. For many major customers, such as AOC, Lite-on, LGE, Philips, Proview, and SEC,

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pricing can be proven, it will then readjust the price back to the agreed prices between various parties." Chunghwa Picture Tubes, LTD, 18 January 2002, Visitation Report, CHU00036392 - CHU00036393, at 6392.01E.

[192] See, e.g.,

- "Still strong feeling about: [para.] Vestel is oriented to have TH [Thomson] as 1st supplier and SDI [Samsung] as 2nd source while…Beko oriented to LPD as preferred supplier and SDI and [sic] 2nd source." Samsung SDI, 04 December 2003, Paris Meeting, SDCRT-0088661 - SDCRT-0088674, at 8672.
- "JVC [:] SDI/T-CRT will be the two suppliers. (The LPD model has been eliminated.) Based on S Company's intention, the G/L [guideline] setting was lowered." MT Picture Display, 18 June 2004, ASEAN MTG (Small and Mid-Sized Units), MTPD-0493552 - MTPD-0493554, at 3553.
- "SDI [Samsung] suggests each customer should have a major vendor to control price/QEY [sic] [quantity] to gradually to [sic] reach that goal that each customer only have two CDT makers for supply." CPT, 24 August 2005, Letter head: Hongxi Creek Resort Ta Shee Resort, CHU00017115, at 1.
- "Agreed on the introduction of the 2 Vendor System by each customer for co-survival of 3 companies from '06…M/S details (agenda) from each customer will be discussed in the Working-Level meeting." Samsung SDI, 30 September 2005, G/S MTG Result Report, SDCRT-0091687 - SDCRT-0091691, at 1689E.

[193] See, e.g.,

- "PH/OEC asked [Chunghwa] to contact IRICO, and explain to IRICO the group's unanimous acknowledgement of its primary position to VESTEL. The three parties will not contact VESTEL for promotions this year and hope that next year, IRICO can increase price to $30 (without tax). PH guarantees that its price can be higher than IRICO's by $1, and the largest supply amount will not be more than 20-25 k/m, and if possible, he will visit IRICO (Date: October 11, awaiting for confirmation from PH [Underlined by hand])." Chunghwa Picture Tubes, LTD, 02 October 1999, Business Report Summary, Topic: European 14" CTV Tube Market, CHU00029048 - CHU00029049, at 9048.01E.
- "[bullet] In order to have stable price it is necessary to have big difference of share and reasonable price gape [sic] between major & minor supplier. [bullet] At least US$0.5 price gap between Major & minor supplier." Chunghwa Picture Tubes, LTD, 17 June 2003, TOP Meeting Arrangement, CHU00660561 - CHU00660574, at 0573.
- "The top six major customers are AOC, Philips, EMC, L-On, SEC and LGE. The rest are in the 'other customers' category. To top six customers, 2nd tier suppliers must quote a price $0.5 higher. This is to take this opportunity to reinforce price differentials between big and small customers for the purpose of stabilizing market shares." Chunghwa Picture Tubes, LTD, 25 March 2004, Return-from-Abroad Trip Report, CHU00031240 - CHU00031247, at 1242E.
- "The above is the 17"F baseline prices of TOP 6 Customers. LPD suggested that each major supplier of major customers could suggest adjustment to the baseline price of that customer, and the other two CDT makers can then adjust their prices according to the new baseline price and maintain the price differential. [Chunghwa] and SDI agreed in principle but this arrangement must be carried out under the premise of actual true baseline prices." Chunghwa Picture Tubes, LTD, 29 December 2004, CDT Market Report, CHU00071480 - CHU00071482, at 1480E.

the cartel also established targets for the shares of the customer's purchases to be supplied by each of the cartel members to which the customer was allocated.[194]

The cartel also divided the market as a whole by establishing target shares of all CDT sales for each cartel member.[195]

g) The cartel used most-favored customer clauses

Cartel members employed most-favored customer clauses in purchase agreements.[196] These terms promised customers they would receive prices no worse than prices charged other

[194] Most instances of this conduct of which I am aware were allocations of shares of CDT customers to cartel members; I am aware of one instance in which a CPT customer was allocated to cartel members. See, e.g.,

- "Mr. Na hoped that they could cooperate closely with [Chunghwa] on delivery quantity/price [to ADI] for mutual benefit. He hoped that delivery amount could be maintained at the original 80K/m Base. SDD would take 50K/m (60%) and [Chunghwa] 30K/m (40%) of M/S." Chunghwa Picture Tubes, LTD, 09 April 1998, Visitation Report, CHU00028642 - CHU00028644, at 8642.03E.
- Regarding division of a CPT customer: "With Thai-CRT/TEDI's promise that they would not grab Chunghwa Picture Tube's M/S [market share] orders (maintained at the original 50%) and that they will follow the prices, the Korean makers requested Chunghwa Picture Tube to take the lead in the price up to USD 32.00/pcs for Shipment to Orion (Thai) in January (Mr. Moon said he could arrange a meeting for the three top decision makers to confirm actual implementation method)." Chunghwa Picture Tubes, LTD, 27 November 1998, Visitation Report (Submit), CHU00029259 - CHU00029261, at 9261.01E.
- "In addition, with regard to each maker's share with A.O.C., it was reviewed and set as follows: [Chunghwa]: 50% PH: 20% SDD/ORION: 30% (SDD and Orion will review as to how to share that 30%)" Chunghwa Picture Tubes, LTD, 18 May 1999, CPT Sales Department Customer Contact Report, Topic: China/AOC 14" CDT Price, CHU00030763 - CHU00030765, at 0764E-0765E.
- Chunghwa, LPD, and SDI review their market share allocations for twelve major CDT customers as decided in a CEO meeting. CDT, 29 April 2003, Agenda, CHU00660539 - CHU00660548, at 0545-0546.
- Agreement between Chunghwa, LPD, and SDI on market share allocation for six (reduced from twelve) major CDT customers. Allocations for LGE, Philips, and Lite-On have already been decided; they are working on a consensus for SEC, AOC, and Proview. Chunghwa Picture Tubes, LTD, 24 February 2005, Itinerary, CHU00647932 - CHU00647943, at 7941-7942.
- Proposal by Chunghwa, LPD, and SDI [Samsung] for market share allocations in 2006 for six major CDT customers. CDT, 13 March 2006, Main Discussion Agenda, SDCRT-0091715 - SDCRT-0091718, at 1718E.

[195] See, e.g.,

- Agreed CDT market shares of Chunghwa, LPD, and SDI for 2002 and 2003, with a comparison to actual results. Samsung SDI, February 2003, Agenda, SDCRT-0088763 - SDCRT-0088772, at 8767.
- Agreed CDT market shares of Chunghwa, LPD, and SDI for 2003 and 2004, with a review of actual market shares for January 2004. Samsung SDI, January 2004, Agenda, SDCRT-0088846 - SDCRT-0088851, at 8848.
- Agreed CDT market shares of Chunghwa, LPD, and SDI for 2005, with a review of actual January and February 2005 market shares. Chunghwa Picture Tubes, LTD, 24 February 2005, Itinerary, CHU00647932 - CHU00647943, at 7935.

[196] See, e.g.,

- From a JVC purchase order with Hitachi America (the ordered product is a CPT): "Seller represents and warrants that the prices are no higher than are currently available from Seller to any other purchaser of similar quantities of substantially identical goods. Any taxes with respect to or on account of the goods

customers, and helped to maintain cartel discipline by raising the cost of cheating: if a cartel member cheated by offering low prices to one customer, it had to offer the same low prices to all customers that had been granted most-favored customer status. This reduced the incentive for a cartel member to cheat on the cartel agreement by lowering prices.[197]

h) Several Defendants participated in the LCD cartel

Several cartel members or their corporate relatives also participated in the LCD cartel, which lasted from approximately 1999 to 2006,[198] including: Chunghwa, Hitachi, LGE, Philips, LPD

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ordered hereunder shall be paid by Seller unless expressly otherwise prescribed by law." JVC, 30 July 1998, JVC Purchase Order, HEDUS-CRT00062277 - HEDUS-CRT00062278, at 2277.

- From an e-mail from Chunghwa to Dell: "We've understood that there's some rumor about [Chunghwa's] Jan [January] pricing, yet it's totally untrue. We havn't [sic] quoted Jan price to any customers at this moment. [para.] You may have our words that you have the MFN among our customers." Wang, Cherry H.C., 08 December 2004, MFN, CHU00635116, at 5116.
- From a general purchasing agreement between Matsushita Electric Industrial and Philips Consumer Electronics: "Supplier shall at all times offer the most favourable prices for the Standard Products only to Buyer, meaning that such prices shall be no less favourable than those currently extended to other customers of Supplier at substantially the same timing, under substantially the same purchase volumes and other conditions." Matsushita Electric Industrial, Philips Consumer Electronics, 20 January 2006, General Purchasing Agreement, MTPD-0436378 - MTPD-0436396, at 6384.
- [redacted]
- From a purchasing agreement between MTPD Indonesia and Sanyo Electronics Indonesia: "The price of the Products shall be decided by the parties hereto upon mutual consultation from time to time; provided, however, prices for the Products shall at no time be greater than the most favorable prices extended at that time to the Seller's most favored customers, taking into account the deference of specifications and delivery terms." PT Sanyo Electronics, PT MT Picture Display, 09 October 2006, Basic Agreement between PT Sanyo Electronics and PT MT Picture Display, MTPD-0336313 - MTPD-0336331, at 6316.
- [redacted]

[197] See, e.g.,

- Cooper, T.E., 1986, Most Favored Customer Pricing and Tacit Collusion, Rand Journal of Economics, Vol. 17, 377-388.
- Jacquemin, Alexis and Margaret E. Slade, 1989, Cartels, Collusion, and Horizontal Merger, Handbook of Industrial Organization, Vol. 1, at 422.
- Salop, Steven C., 1986, Practices That (Credibly) Facilitate Oligopoly Coordination, New Developments in the Analysis of Market Structure, MIT Press: Cambridge: Massachusetts, (Joseph Stiglitz and Frank Mathewson, eds.).
- Tirole, Jean, 1988, The Theory of Industrial Organization, The MIT Press: Cambridge, Massachusetts, at 330-332.

[198] See, e.g.,

(the joint venture between LGE and Philips), Mitsubishi, MTPD, Toshiba, and Samsung. The DOJ prosecuted members of the LCD cartel for violating Section 1 of the Sherman Act, resulting in numerous guilty pleas and fines totaling hundreds of millions of dollars. Chunghwa, Hitachi, and LG Display Co. (a LCD joint venture between LGE and Philips) pleaded guilty and paid criminal fines.[199] Toshiba was found guilty by the jury in the direct purchaser case and was ordered to pay $87 million to class members.[200] In addition, competition agencies in China, the European Union, and South Korea fined Chunghwa, LG Display, and Samsung a total of nearly $476 million for their participation in the LCD cartel.[201]

It is well established in the economics literature that such "multi-market contact" can be conducive to cartel success.[202]

- 28 March 2010, Order Granting Indirect Purchaser Plaintiffs' Motion For Class Certification; Denying Defendants' Motion to Strike Modified Class Definitions; Granting Motions to Strike Untimely Declarations, In re: TFT-LCD (Flat Panel) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).
- 28 March 2010, Order Granting In Part and Denying In Part Direct Purchaser Plaintiffs' Motion For Class Certification; Granting Defendants' Motion to Strike Untimely Declarations, In re: TFT-LCD (Flat Panel) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

[199] See, e.g.,

- U.S. Department of Justice, 12 November 2008, LG, Sharp, Chunghwa Agree to Plead Guilty, Pay Total of $585 Million in Fines for Participating in LCD Price-fixing Conspiracies, http://www.justice.gov/opa/pr/2008/November/08-at-1002.html, accessed 31 March 2014.
- U.S. Department of Justice, 10 March 2009, Hitachi Displays Agrees to Plead Guilty and Pay $31 Million Fine for Participating in LCD Price-Fixing Conspiracy, http://www.justice.gov/opa/pr/2009/March/09-at-210.html, accessed 31 March 2014.

[200] James, Ben, 11 September 2012, Toshiba To Pay Direct LCD Buyers $30M In Price-Fixing MDL, Law360, http://www.law360.com/articles/377122/toshiba-to-pay-direct-lcd-buyers-30m-in-price-fixing-mdl, accessed 08 April 2014.

[201] See, e.g.,

- Qi, Liyan, Min-Jeong Lee and Lorraine Luk, 04 January 2013, China Fines Makers of LCD Screens, The Wall Street Journal, http://online.wsj.com/news/articles/SB10001424127887323374504578220862089391652, accessed 08 April 2014.
- Lee, Jung-Ah, 31 October 2011, Seoul Fines Six LCD Manufacturers in Price-Fixing Case, The Wall Street Journal, http://online.wsj.com/news/articles/SB10001424052970204528204577007682854719686, accessed 08 April 2014.
- White, Aoife, 08 December 2010, LCD-Panel Makers Fined $649 Million by European Union for Price Fixing, Bloomberg, http://www.bloomberg.com/news/2010-12-08/six-lcd-panel-makers-fined-649-million-by-european-union-for-price-fixing.html, accessed 08 April 2014.
- Lipman, Melissa, 27 February 2014, LG, InnoLux LCD Cartel Fines Trimmed By $23M In EU Court, Law360, http://www.law360.com/articles/513907/lg-innolux-lcd-cartel-fines-trimmed-by-23m-in-eu-court, accessed 08 April 2014.
- Kanter, James, 08 December 2010, Europe Fines Five Flat-Panel Screen Makers for Price Fixing, The New York Times, http://www.nytimes.com/2010/12/09/business/global/09fine.html?_r=0, accessed 08 April 2014.

[202] See, e.g.,

4. The evidence confirms the cartel successfully raised prices

a) The cartel raised the price of the CRTs for which we observe target prices

As a direct test of whether the cartel affected the prices of CRTs, I implemented a regression analysis of whether target prices "Granger cause" actual prices. As described in Section VIII.A.3.b), the CRT cartel members set target prices to which they were to adhere when selling CRTs. By setting these prices, cartel members sought to cause the prices of CRTs to increase above their competitive levels. The regression analysis I undertook examined whether the cartel was successful in its efforts.

I have found documentation of over 130 meetings between cartel members at which target prices were set. See Exhibit 1. I matched the target prices with the prices direct purchasers paid for the corresponding tubes.[203] I have been able to match target prices to approximately 29.7% of CPT sales and 39.0% of CDT sales in the data produced by Defendants.[204]

There are several possible reasons I did not observe more target prices. Cartel members understood that setting target prices was illegal and indicated attempts to conceal such activity.[205]

- Bernheim, B. Douglas and Michael D. Whinston, 1990, Multimarket Contact and Collusive Behavior, RAND Journal of Economics, Vol. 21(1), 1-26.
- Bond, Eric, 2004, Antitrust Policy in Open Economies: Price Fixing and International Cartels in Handbook of International Trade, Volume II: Economic and Legal Analyses of Trade Policy and Institutions, Choi and Hartigan (eds), Blackwell Publishing.
- Deltas, George, Serfes, Konstantinos, and Richard Sicotte, 1999, American Shipping Cartels In The Pre-World War I Era, Research in Economic History, Vol. 19, 1-38.

[203] I matched target prices to actual observed cartel prices using the following procedure. I defined a product group to be all CRT models with the same application, size, and finish (bare or ITC). Most of the Defendant sales data are not sufficiently detailed to match on tube shape (round or flat). For the analysis described in this sub-section, I ignore shape data when available and treat flat and round tubes the same. For each manufacturer and customer pair, I calculated the average price of all products within a group sold during each calendar quarter. These are the actual prices. I then matched these actual prices to target prices that were applicable to each manufacturer, group, and time period. If the meeting notes did not specify the manufacturers to which a target price applied, or if the same target price applied to all manufacturers at the meeting, I assumed that it applied to all manufacturers in the cartel. Meeting notes typically included the month or quarter when a target price was to be effective. If different meetings produced multiple target prices for the same quarter, I used an average of the available target prices, weighting each target price according to the length of time it would have been in effect.

[204] See combine_target_defendant.smcl in my backup for calculations.

[205] See, e.g.,

- "Large size price trend: 25V $102-103 (major customer, bottom price standard) Based on North America antitrust law, CRT companies are not to discuss prices with each other, but in my opinion it appears to be a price we heard from Philips [return] Price gap between 25v and 27V: Tube (ITC standard) around $35, set retail standard $40-50." Im, Chul Hong, 12 January 1999, North America CPT companies meeting summary, SDCRT-0002526 - SDCRT-0002528, at 2528E.
- From meeting notes: "The industry meetings should remain confidential in consideration of international antitrust laws". Shenzhen Samsung Display Device, 05 August 1999, The Chinese Industry Meeting (August), SDCRT-0086672 - SDCRT-0086674, at 6672E.
- From an internal Toshiba e-mail: "* Below, I ask you to destroy after reading * [paragraph] I am sure you are aware, but it is a fact that information exchange is being conducted occasionally among the three

Target prices may have been set over the phone or not written down. For this reason alone, it is almost certain that the cartel set target prices that we do not observe.

In addition, the cartel did not need to explicitly set target prices for all products to increase prices for all products because the prices of various CRT models are closely and predictably related; a few key tube characteristics such as size and application account for most of the variation in CRT prices. See Section VIII.A.4.b)(2). By explicitly setting a target price for certain tubes, the price of other tubes would rise as well.

Also, setting target prices was not the only way to collusively raise prices. For example, the cartel restricted output (see SectionVIII.A.3.c)), which also raised prices above the competitive level. The cartel shared sensitive pricing information and allocated customers (see Sections VIII.A.3.b) and VIII.A.3.f)), which also results in higher prices. It is possible that the cartel would set target prices for some CRTs while using one or more alternative methods to raise the price of other CRTs.

Regardless of the reason, I observed target prices that apply to some, but not all, of Defendants' tube sales. The prices charged by Defendants closely tracked the collusive target prices; see

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companies, Samsung, Orion and TAEC (TDD), regarding NAFTA's mid-size tubes. It is mainly general information, but since there are times that specific matters are discussed such as each's CPT supply proposals for each customer's (TV) planned production volume, as a result, the actual situation is that each Bulb store has considerably accurate understanding of information such as which customer is securing how much CPT for the set production volume." Yoshino, Michihiro, 24 January 2000, E-mail, Subject: Re: Destroy After Reading: GM Mizushima's complaint regarding Funai Electric's TDD 19v CPT Inquiry, TSB-CRT-00042440 - TSB-CRT-00042443, at 2440.

- An internal Toshiba e-mail with a subject line "SDI information - Confidential- please destroy after reading" summarized information obtained from Samsung Japan. The e-mail covered SDI organization, CDT factory utilization rate, planned monthly production figures, and average prices for various CDTs during January - March of 2001. Yamamoto, Yasuki, 15 January 2001, E-mail, Subject: SOI information - Confidential- please destroy after reading, TSB-CRT-00041746 - TSB-CRT-00041749, at 1746 - 1747.
- An internal MTPD e-mail has the subject, "(Confidential) Thomson Mexicali Factory Information". The body text says, "Since this is in violation of antitrust, please do not leak it to others. Thomson production information. Sales figures obtained from the marketing unit at the Paris headquarters. It's the Marion A59 25V." The e-mail was forwarded to other MTPD employees in the U.S. with the warning "Please treat this as strictly confidential. It is information about the advancement of business." Kinoshita, Ayumu, 02 July 2003, E-mail, Subject: FW: (Confidential) Thomson Mexicali Factory Information, MTPD-0035375 - MTPD-0035376, at 5375E.
- An internal MTPD e-mail discussed a meeting held with Samsung and LPD on November 28, 2003. The subject line says, "*Highly Confidential/Destroy after Reading* South Korean CRT information (quantities and lines)". The e-mail begins with, "I am reporting on the substance of information about SDI and LPD I obtained on November 28, 2003, as follows. Please treat this matter as *highly confidential*, and please keep the fact that this meeting, meeting minutes, and so on exists as *highly confidential*." Kinoshita, Ayumu, 11 December 2003, E-mail, Subject: FW Highly Confidential/Destroy after Reading South Korea CRT information (quantities and lines), MTPD-0038856 - MTPD-0038859, at 8857E.
- A Glass Meeting agenda has "The Method to avoid anti trust law" on the Any Other Business (A.O.B.) page. Chunghwa Picture Tubes, LTD, 17 August 2004, Itinerary, CHU00660717 - CHU00660727, at 0727.
- From an internal MTPD e-mail: "This is the industry meeting memo. Destroy after reading." Attachment is a meeting memo from February 2007. Sanogawaya, Masaki, 09 November 2007, E-mail, Subject: Meeting memo, MTPD-0543148 - MTPD-0543150, at 3148E.

Exhibits 30-36.[206] The fact that actual prices closely track target prices indicates that the cartel succeeded in charging the agreed-upon prices. To confirm the causal relationship between target and actual prices, I performed a widely-accepted economic test of causation: the Granger causation test.[207] This analysis determines whether one kind of information (here, target price) can reliably predict a future outcome (here, actual price). If it does, then that source of information is said to "Granger cause" the outcome.

I used this analysis to determine whether the cartel's target prices predict the actual prices Defendants charged direct purchasers. I estimated separate equations for CDTs and CPTs, which allows the target price to influence the actual price differently for each type of tube. I calculated the actual weighted-average quarterly selling price for each application, size, finish, manufacturer, and customer combination. For example, I calculated the average selling price for all 17" ITC CDTs sold by Samsung to Compal in 1999 Q3.

I estimated a regression in which the logarithm of actual price was a function of the logarithm of the previous quarter's actual price, the logarithm of the matched target price, the size of the CRT multiplied by the logarithm of the cost of glass (an input needed to produce CRTs), and measures of global economic growth and unemployment (variables to indicate the strength of demand).[208] Including the lagged actual price, glass costs, and macroeconomic variables ensures that the estimated relationship between target and actual prices was not simply the result of general factors affecting supply and demand for CRTs. I also included application, size, finish, manufacturer, and customer fixed effects.

The results of the regressions are presented in Exhibits 37 and 38. For both CDT and CPT, the collusive target prices exhibit a strong, positive, and economically meaningful predictive effect on the actual prices charged by Defendants; that is, when the target price increased, so did the actual price. These effects are statistically significant at the 1% level.

For the products included in this analysis, I found that target prices strongly predict the price Defendants charged direct purchasers. This is clear evidence that the cartel's activities increased the price for CRTs for which the cartel set targets.

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[206] Exhibits 30-36 include actual and target prices for 15, 17, and 19-inch CDTs, and 14, 20, 21, and 29-inch CPTs. These sizes account for 84% of tubes represented in the Defendant sales data.

[207] See, e.g.,

- Granger, C. W. J., 1969, Investigating Causal Relations by Econometric Models and Cross-spectral Methods, Econometrica, Vol. 37, No. 3, 424–438.
- Kaufmann, Robert K., Dees, Stephane Dees, Karadeloglou, Pavlos, and Marcelo Sanchez, 2004, Does OPEC Matter? An Econometric Analysis of Oil Prices, Energy Journal, Vol. 25, Issue 4, 67-90.
- Soytasa, Ugur and Ramazan Sarib, 2003, Energy consumption and GDP: causality relationship in G-7 countries and emerging markets, Energy Economics, Vol. 25, 33-37.

[208] The (natural) logarithm of a number is the exponent (or power) to which the number e ≈ 2.72 must be raised to equal that number. For example, the natural logarithm of 5 is approximately 1.609 because e raised to the power of 1.609 is equal to 5. Logarithmic transformations of the sort employed here are commonly used to reduce the variance of the data used in the model, which can be desirable when working with data that cover a wide range of values. Another feature of using the logarithmic transformation in multiple regression is that the estimated coefficients are interpreted as elasticities. For example, a coefficient estimate of 2 for the variable ln(X) would imply that a 1% change in the value of X is associated with a 2% change in the value of Y.

b) The cartel succeeded in raising the prices of all CRTs

Although we do not observe target prices for all CRTs that were sold, there is strong evidence the cartel raised the prices of all CRTs.

(1) A profit-maximizing cartel seeks to raise the prices of all products

It is uncontroversial that cartels have the incentive to set prices above the competitive price.[209] I have seen no evidence to suggest that any model of CRT was exempt from this general rule. The reason cartels have this incentive is straightforward: when a cartel controls all or most of the supply in a market, consumers' only alternative to buying at the cartel's price is to substitute to goods outside the market.

Cartels' incentive to raise the prices of all of its cartelized products is reinforced when a cartel sells multiple products that substitute for each other: effectively raising the price of each CRT requires that the prices of its potential substitute CRTs also be raised, as the following example illustrates. Suppose the CRT cartel raised the price of 15" CDTs above the competitive level, but left the price of 17" CDTs at the competitive level. Given the relative price increase of 15" CRTs, some consumers would substitute away from 15" monitors towards 17" models, thereby escaping the price increase. Rational cartelization (that is, operating the cartel to maximize the joint profit of cartel members) requires that the cartel set prices that eliminate opportunities for buyers to escape overcharges. Thus, in this hypothetical example, rather than raise the price of the 15" CDT alone, the cartel would earn higher profits by raising the prices of both the 15" and 17" CDTs. In that way, consumers cannot avoid the overcharge on the 15" CDT by substituting to 17" CDTs. Similarly, a profit-maximizing cartel seeks to raise the prices in all transactions, regardless of the identity of the purchaser or the location of the end-user.

[redacted]

[209] "In any market, firms have an incentive to coordinate their production and pricing activities to increase their collective and individual profits by restricting market output and raising the market price. An association of firms that explicitly coordinates its pricing or output activities is called a cartel." Carlton, Dennis and Jeffery M. Perloff, 2005, Modern Industrial Organization, Fourth Edition, Addison-Wesley Longman, Inc., at 122.

[redacted]

[redacted]

(2) The cartel did not need to set target prices for every CRT in order to raise all CRT prices

It was not necessary for the cartel members to set target prices for every type of CRT in order to raise the prices for all CRTs. As discussed in my class certification report and rebuttal,[212] the prices of different types of CRTs are related to each other through a price structure. That is, standard market forces impose a relationship between CRTs of different types, say between a 15" flat CDT and a 15" round CDT or between a 21" widescreen CPT and a 25" widescreen CPT.

The cartel took advantage of the relationship between different types of CRTs by setting price differentials corresponding to common product differentiators. [redacted] These considerations would lead cartel members to recognize that if the price of a model without the differentiator were raised, rational pricing requires that the price of the differentiated product should also be raised, and they "would certainly raise the prices at the

[211] "It is part of the task of maximizing industry profits to employ a price structure that takes account of the larger differences in the costs of various classes of transactions … A price structure of some complexity will usually be the goal of collusive oligopolists." Stigler, George J., February 1964, A Theory of Oligopoly, The Journal of Political Economy, Vol. 72, No. 1, 44 - 61, at 45.

[212] See,

- Netz Class Cert Report, at 68 - 71.
- Netz Rebuttal, at 42 - 43.

[redacted]

same time". Other cartel participants also recognized the relationship between prices of different CRTs.[214]

The hedonic regression analyses that I implemented for class certification proceedings likewise show that CRT prices are determined primarily by product attributes. This analysis showed that

[214] See, e.g.,

- "The 14" CDT price especially directly affects the 15" CDTs market fluctuation." Chunghwa Picture Tubes, LTD, 09 February 1996, Visiting Report, CHU00028302 - CHU00028304, at 8303.01E.
- "14"/15"'s current pricing continue to slide, although 15" is a bit more stable, but it will still be squeezing 17"'s pricing. By 94/E [end of 1994], the price differentials between tube sizes would be: 15"/14": USD 40.00/pc- 17"/15": USD/10/pc. Based on market condition, current selling price of 14" has reached the price of 94/E, price differentials between sizes are being maintained in general, but if the price of 14" does not stabilize, then the prices of 15"/17" would again be squeezed to drop; if CDT price does not stabilize, it would be not be beneficial to Monitor or picture tube industry. CDT industry should strengthen contacts and mutually agree to reduce production in order to stabilize pricing." CPT, Du, Ching-Yuan (Michael), 23 September 1996, Customer Contact Report, CHU00028400 - CHU00028401, at 8400.02E - 8401E.
- "Mr. Moon emphasized that if we were looking forward to another round of price rise for 17", then the market price of 19" absolutely needed to be raised." Hsieh, Chun-Mei (Christina), 10 February 1999, Visitation Report, CHU00030713 - CHU00030716, at 0714.02E.
- "Also believes that the current price differential of 15"/17" tube has been narrowed down to around $20. 17" tube should not drop price further so as to avoid impact on the demand for 15" tube." Chunghwa Picture Tubes, LTD, 09 November 1999, Visitation Report, CHU00030916, at 0916.01E.
- "SDI: 14" US market was impacted by the shortened price gap to 20", sales volume dropped 15%, but overall sales total for 2Q is similar to that of 1Q." Chunghwa Picture Tubes, LTD, 18 April 2001, Overseas Visitation Report, CHU00024560 - CHU00024562, at 4562.01.
- "How to determine price for the 29"? We should stabilize the price even if we have to stop production. If that works, the price could recover up to 1,050 from 1,000 [RMB], which will also help 21" & 25" sales. Should consider investment and imported tube price before price setting and avoid sales at unreasonable prices that may cause a deficit." May 2001, Report of Color CRT Industry Meeting, SDCRT-0087694 - SDCRT-0087698 at 2.
- Notes from a November 2003 Glass Meeting indicate widespread agreement that the price of a 21" RF [real flat] tube is closely related to the price of other small and medium-sized tubes. "21" RF [real flat] price plays a significant role for the medium & small sizes. In an effort to alleviate the pressure on 21"FS [flat square – a type of round tube]/20"/14", all attendees feel that the 21"RF price must be maintained." CPT, 07 November 2003, Market Visitation Report (Glass Meeting), CHU00030071 - CHU00030093, at 0073.01E.
- "The 21"PF [pure flat] price continues to pressure 21FS [flat square – a type of round tube], especially the A/K Type, so, should MTPD lead a 21" PF price increase in order to stretch the 21"FS and 21"PF price difference?" Chunghwa Picture Tubes, LTD, 29 April 2004, Overseas Trip Report, CHU00030005 - CHU00030007, at 0007.02E.
- "Since there is less capacity for price reductions due to the 30 VW [30 viewable inches, widescreen] investment depreciation, SDI is continuing with restructuring to prepare for the market downturn. With no excess capacity and it being unlikely that demand will increase with a reduction in price, we want to keep price cuts limited as much as possible. The concern is that the reduction in overall CRT demand will lead to falling prices, and that the collapse of 32 VPF [32 viewable inches, pure flat] prices due to this collapse in demand balance will spread to 30 VW and lower. (In other words, apparently there will be no price reduction for 32V for MTPDA)." Tsuruta, Shinichiro, 24 August 2005, E-mail, Subject: Re: SDI North America Information, MTPD-0303225 - MTPD-0303228, at 3228E.

the prices Defendants charged to direct purchasers could be closely approximated by a formula common to all direct purchasers. Based on the results, I conclude that CRT prices of different types are related to each other via product characteristics, and therefore setting a target price increase for one type of CRT implies a price increase for other CRTs.

I updated the same hedonic regression of price as a function of product characteristics, a time trend, and indicator variables for buyer-seller pairs as I did previously.[215,216] Mathematically, the regression I estimated was

$$\ln\left(Price_{ijt}\right) = \beta_0 + \beta_1 Char_i + \beta_2 SB_j + \gamma_1 Time_t + \gamma_2 Time_t^2 + \varepsilon_{ijt} ,$$

where $Price_{ijt}$ is the price charged for CRT model *i* between seller-buyer pair *j* at time *t*; $Char_i$ is a vector of indicator variables for product characteristics, including aspect ratio (wide or not), size, and finish (bare or ITC) of CRT model *i*; SB_j is an indicator variable for seller-buyer pair *j*;[217] and the time variables allow for a trending influence on price.[218] I fitted the model separately for CDTs and CPTs. The results of the regressions are presented in Exhibits 40 and 41.

Both regressions are highly significant. The R^2 of the CDT regression is 0.91, which means that 91% of the variation in the logarithm of price for CDTs can be explained by product characteristics, buyer-seller pairs, and a time trend. The R^2 of the CPT regression is 0.97, which means that 97% of the variation in the logarithm of price for CPTs can be explained by product characteristics, buyer-seller pairs, and a time trend.[219]

The results of the hedonic regressions demonstrate that the relationship between the prices of different CRT prices were predictable and determined by a handful of product characteristics. Defendants' employees, as experienced businesspeople responsible for setting CRT prices, were aware of the relationships between prices of CRTs with different characteristics.[220] When the

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[215] I updated the hedonics analyses to reflect (1) additional Defendant data and additional information on the interpretation of Defendant data obtained since class certification proceedings; and (2) a change from analyzing Defendant data at the monthly level to analyzing defendant data at the quarterly level. I made the latter change to better account for price adjustments occurring within a given quarter. See footnote 294 for further details.

[216] See,

- Netz Class Cert Report, at 70.
- Netz Rebuttal, at 42.

[217] Seller-buyer pairs were identified by customer names in each defendant dataset. Alternate spellings of a single customer name within a given defendant dataset resulted in separate seller-buyer pairs for each spelling variation.

[218] For notational ease, in this representation β_1 and β_2 represented sets of coefficients. The set of β_1 coefficients included coefficients for each product characteristic observed in the data. For example, there was a coefficient for each size of CRT. Similarly, the set of β_2 coefficients included a coefficient for each seller-buyer pair.

[219] I examined the variance in the logarithm of price. The variation in price and the logarithm of price are very close; see footnote 224 in Netz Class Cert Report.

[220] See, e.g.,

- Size:
  - "With regard to the price differential for 14"/15", MR. MOON believes that unless it can be reduced to under USD32, it would be difficult to have any sign of improvement for 15" CDT!" Chunghwa Picture Tubes, LTD, 24 May 1996, Sales & Marketing Division Visiting Report, CHU00028968 - CHU00028969, at 8969E.

cartel agreed to change the price of certain CRTs, cartel members understood the implication such a change in price would have on the prices of other CRTs with slightly different product characteristics.[221] Thus, even when the cartel only explicitly set target prices for some CRTs, I

- "21" RF [real flat] price plays a significant role for the medium & small sizes. In an effort to alleviate the pressure on 21"FS [flat square]/20"/14", all attendees feel that the 21"RF price must be maintained." CPT, 07 November 2003, Market Visitation Report (Glass Meeting), CHU00030071 - CHU00030093 at 0073.01E.
- "In the event that the price range of the ultra-large set is lowered to $220 to $230, decrease in the price of the 27V flat is inevitable." Samsung SDI, 10 March 2003, LPD, SDCRT-0002588 - SDCRT-0002589, at 2589E. [redacted]
- Notes from Samsung's discussion with Thomson at the 2004 CES in Las Vegas: "The burden of operating a jumbo size line is serious. They are desperately reducing prices, etc., to escape the crisis, and this is affecting the prices of even our large models." Samsung SDI, 07 January 2004, 2004 International CES Business Trip Report (Jan. 7 - 14), SDCRT-0005180 - SDCRT-0005189, at 5183E.
- "[redacted]
- "SLIM Price GAP needs to be reduced compared to NORMAL, but if the SLIM price is lowered then the 32" NORMAL price will need to go down and 29" price will need to go down, too. This is the industry's agony." Samsung SDI, 15 November 2005, Thomson, SDCRT-0091537 - SDCRT-0091545, at 1542E
- "According to them they cannot get 29"SF [square flat] CTV orders from customers since 28" CTV price is approx. $35 cheaper than 29"SF and consumers buy 28"." MT Picture Display, 19 January 2006, MTPD-0410475, MTPD-0410475.

- Other attributes:
  - "… the price difference between invar and AK products is known in the industry to be US$1.5-US$2.00." MT Picture Display, 17 September 2004, CRT Industry Meeting, MTPD-0580795, at 0795.
  - "SLIM Price GAP needs to be reduced compared to NORMAL, but if the SLIM price is lowered then the 32" NORMAL price will need to go down and 29" price will need to go down, too. This is the industry's agony." Samsung SDI, 15 November 2005, Thomson, SDCRT-0091537 - SDCRT-0091545, at 1542E.
  - "Since the price differential has narrowed down, the demand for 21"FS [flat square] has clearly shifted to 21"RF [real flat]." Jimmy, Wu, Meng Ying, 07 February 2007, Market Visitation Report (Glass Meeting), CHU00030437 - CHU00030438, at 0437.02E.
  - [redacted]

[redacted]

expect that prices for other CRTs would be affected as well. In the next section, I test this hypothesis.

(3) Observed target prices predict actual prices of CRTs for which we do not observe target prices

As described above, I did not find documentary evidence that the cartel set target prices for all types of CRTs but the cartel had the incentive and the ability to affect CRT prices more generally. The prices of CDTs and CPTs for which I did not observe target prices closely track the target prices that I did observe. Exhibits 42 and 43 illustrate this relationship by plotting an index of target prices and an index composed of the prices of tubes for which I did not observe target prices.[222] The correlation is 0.89 for CDTs and 0.92 for CPTs, and both are statistically significant.[223]

In addition to examining the correlation between the prices of CRTs with explicit target prices and those without, I used regression analysis to confirm that the data are consistent with the cartel affecting the prices of CRTs without explicit target prices by running a similar regression analysis that I used for CRTs that had explicit target prices, as described in Section VIII.A.4.a). The analysis is slightly different because it is unclear how one would match actual CRT prices that did not have a target price to target prices. Therefore I calculated an index of CPT or CDT target prices to use in the regression analysis. If the target price index predicts the actual prices of CRTs for which I did not observe target prices, I can conclude that the cartel's target prices had the effect of raising the prices of all CRTs.

I estimated separate regressions for CPTs and CDTs in which the logarithm of the actual price is a function of the logarithm of the previous quarter's price, the logarithm of the target price index, the size of the CRT multiplied by the logarithm of the cost of glass, and measures of global



[222] The Fisher price index for a given month is a weighted average of the changes in target prices from the previous period. It uses as weights both the current and previous months' sales volumes from Defendants' sales data. These monthly index values are then "chained" together to produce a measure of the change in target prices over longer periods of time. This approach allowed me to measure average changes in target prices over time despite changing composition of target prices from period to period.

Most of the Defendant sales data do not include detail on tube shape. For the purpose of calculating the price indices used in this sub-section, I assumed the tube was round if shape wasn't specified and excluded sales of tubes which were identified as flat screens.

[223] See actual_price_index.smcl in my backup for calculations.

economic growth and unemployment. This is identical to the model used in Section VIII.A.4.a) with the matched target price replaced by the index of target prices.

The results of the regressions are presented in Exhibits 44 and 45. I found that for both CDT and CPT, the collusive target price indices exhibit a strong, positive, and economically meaningful predictive effect on the actual prices charged by Defendants. These effects are statistically significant at the 1% level.

There are at least two reasons why higher target prices strongly predict higher prices for CRTs that did not have explicit target prices. The most straightforward reason is that cartel almost certainly set some target prices that I did not observe. These unobserved target prices would be positively correlated with the observed target prices given a profit-maximizing cartel. The target price index in the regression thus acts as a proxy for the unobserved target prices.

Another explanation for the relationship between the target price indices and the prices of CRTs that did not have explicit target prices is that the cartel used methods in addition to target prices in its effort to maintain supra-competitive prices, e.g., output restrictions and information sharing. These methods are generally unobservable and/or difficult to quantify but they are likely correlated with the observed target prices. For example, the cartel's efforts to restrict output would be expected to bear a relationship to the target prices it set, with greater reductions in output associated with higher target and actual prices. For this reason, the target price index in our regression also acts as a proxy for these other methods of raising prices.

5. The cartel's price-fixing impacted the U.S.

During the class period, the U.S. was a major market for CRT finished goods; see Exhibits 46 and 47 and Footnote 225. The cartel sought to raise the price of tubes used in virtually all of these products sold in the U.S. and other regions. Because the cartel accounted for approximately 85% of CPT sales and 90% of CDT sales during the class period, it was well-situated to do so. See Exhibits 4, 5, and 11.

There are at least four routes by which tubes produced by Defendants could end up in the hands of U.S. class members:

1. Defendants manufactured CRTs in the U.S. that were then sold to U.S. producers of finished goods and consumed as TVs or monitors by American end-purchasers.
2. Defendants produced CRTs outside the U.S. that were then sold to U.S. producers of finished goods and consumed as TVs or monitors by American end-purchasers.
3. Defendants produced CRTs outside the U.S. that were then sold to foreign producers of finished goods, imported into the U.S. as TVs or monitors, and then consumed by American end-purchasers.
4. Defendants produced CRTs in the U.S. that were exported, then integrated into finished goods, and then shipped back to the U.S. for consumption.

During the class period, the geographic source of CDT and CPT finished goods that were sold in the U.S. differed. Almost all CDT and monitor production destined for the U.S. market took place in Asia while a significant portion of CPT and TV production destined for U.S. consumers took place closer to the U.S. final consumers. Regardless of the geographic path through which a

particular CRT traveled from manufacturer to end-user, the cartel caused prices paid by U.S. class members to be higher.

a) CDT

Between 1995 and 2007, Asia dominated the production of both CDTs (see Exhibits 48 and 49) and monitors (see Exhibit 50). Asia served as the main source of these products for North America,[224] the world's largest monitor market for most of the class period; see Exhibit 46.[225] North American tube manufacturers, limited participants in the CDT market from the start, were completely out of that business by 2003; see Exhibit 2.

As I discussed in Section VI.C.1, the cartel dominated the CDT market with a combined 88.5% market share in 1998 – a figure that grew to 100% by 2004; see Exhibit 4. Given the size and importance of the U.S. monitor market, Defendants' collusive conduct affected the prices U.S. end-users paid for CRT monitors. In fact, Defendants and other industry participants acknowledge that changes in the prices of CRTs are passed-through to U.S. end-users. See Section VIII.B.3.

Defendants exchanged information relevant to North America, including pricing and demand conditions.[226]

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[224] See, e.g.

- "THE WITNESS: Yes, as you know, CDTs are the ones that are used for computer monitors and unlike the ones used for TVs most of the global production is done in China, Korea and Taiwan, these South East Asian countries. They are produced there and exported in the form of sets. Because they were hardly produced in any other regions, I do not recall much about CDTs produced or supplied in North American region. Also because, in the case of computer monitors, globally no import duties are charged. For TV sets there's an import duty of 15 per cent. However because computer monitors are regarded as industrial products there's no duty. So instead of doing local production they were produced in countries with cost competitiveness, such as China and South East Asia for supply." 22 March 2013, Deposition of Sang-Kyu Park, Volume III (Hereinafter "Deposition of Sang-Kyu Park, Vol. III, 22 March 2013"), at 340:2 - 17.
- "A. There wasn't much of a color display tube market in the United States. From the time I joined Hitachi in 1986 until the end there was never a market here because most of the monitor makers were in Asia." Hitachi 30(b)(6) Deposition of Thomas Heiser, 03 July 2012, at 60:11 - 17.
- "[F]ew CDTs were produced in North America (most of the monitor production was in Asia)". Willig, Robert D., 14 December 2012, Expert Report of Robert D. Willig, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Willig Report"), at ¶67.
- "Let me ask, with respect to monitor makers who were customers of Chunghwa's Fuzhou plant [in China]. Do you know if those monitor makers exported monitors with color display tubes from the Fuzhou plant into the United States? [objections omitted] THE WITNESS: Some were exported to the United States, I know that." 28 February 2013, Deposition of Jing Song Lu, Volume II (Hereinafter "Deposition of Jing Song Lu, Vol. II, 28 February 2013"), at 241:13 - 241:22.

[225] See, e.g., "The world's largest monitor market is North America, where about 20 million monitors were sold in 1995 - 40% of the world's total." Philips, Undated, Philips Display Components Company North America Strategy Review 1996-2000, PHLP-CRT-081451 - PHLP-CRT-081491, at 1472.

[226] [redacted]

b) CPT

CPT production for the U.S. market was located in both Asia and North America.[227] See Exhibit 51. CRT TV production for the North American market was also based in various locations; see Exhibit 52. Importantly, as I described in my Rebuttal Report,[228] North American consumer demand for CPTs and CRT televisions can only be met by NTSC-compatible CPTs – a specific broadcast standard distinct from the standards required for tubes sold to Europe, Africa, and most of Asia. Broadcast standard compatibility, and hence suitability for meeting U.S. consumer demand, is an inherent characteristic of every CPT, determined when it is being manufactured. North American TV manufacturers sourced the majority of their tubes from local CPT makers while also importing a significant portion of tubes, typically from Asia.[229] In North America, imported CPTs accounted for about 15% of total CPT sales in 1995, increasing to about 25% in 2003.[230]

North America was a large market (see Exhibit 47), served by both domestic and foreign TV manufacturers. Imported TVs became increasingly common during the class period; as of 2003, over 60% of CRT televisions consumed in North America were imports.[231] Most imported TVs came from Asian countries and contained Asian tubes.[232]

[redacted]

[227] Deposition of Sang-Kyu Park, Vol. III, 22 March 2013, at 340:2 - 17.

[228] Netz Rebuttal, at 52.

[229] See, e.g.,

- LG Philips Displays, 2003, LPD_00014554.
- December 2003, North American TV and CRT Market Condition Report for 2003, MTPD-0083663, at 3.
- LG's TV manufacturing plant in Reynosa, Mexico obtained at least 32% of its CPTs from Asian sources from 2005 to 2007. See LGERS sourcing.do.
- Similarly, Sanyo's TV manufacturing plant in Forrest City, Arkansas imported at least 11% of its CPTs from Asian sources between 1995 and 2007. See SMC sourcing.do.

[230] See, e.g.,

- LG Philips Displays, 2003, LPD_00014554.
- December 2003, North American TV and CRT Market Condition Report for 2003, MTPD-0083663, at 3.

[231] December 2003, North American TV and CRT Market Condition Report for 2003, MTPD-0083663, at 3.

[232] December 2003, North American TV and CRT Market Condition Report for 2003, MTPD-0083663, at 3.

Defendants regularly exchanged information relevant to North America, including pricing and demand conditions. The cartel met in the U.S. and cooperated on pricing of CPTs in the U.S. Samsung explained that it was "meeting with North American businesses in order to find a cooperation plan related to areas of common interest, and secure communication channels to continuously maintain such relationship" and indicated Samsung's "North American market strategy [includes] Continuous maintenance of mutual cooperation within market."[233] Other meeting notes and Defendant testimony indicate that cartel members, at the very least, discussed prices of CPTs in U.S. meetings[234] and expressed their desire to cooperate on pricing in the U.S.

[233] Im, Chul Hong, 12 January 1999, North America CPT companies meeting summary, SDCRT-0002526 - SDCRT-0002528, at 2526E and 2527E.

[234] See, e.g.,

- MDDA (Matsushita's Troy, OH, CPT plant) exchanged market information "such as production capacity and the production situation, and also discussed the exchanged CRT price situation information" with Hitachi between 1998 and 2002. MDDA also discussed price information with Toshiba between 1998 and 2002. Deposition of Hirokazu Nishiyama, Vol. I, 05 March 2013, at 151:6 - 156:23.
- MDDA/MTPDA had meetings with Thomson between 2002 and 2006. At these meetings, they discussed production, capacity, and general market prices of North American CRTs including Thomson, LPD, MTPD, and SDI. Deposition of Shinichi Iwamoto, Vol. I, 07 February 2013, at 45:17 - 48:3.
- MDDA, TDDA (Toshiba Display Devices America), and Thomson met in 2003 and discussed Thomson's sales status, North American market trends, and price status. 19 August 2003, Record of Meeting with T Company (Confidential), MTPD-0576483, at 6483E.
- An employee of Matsushita met with Samsung every three or four months while stationed in the U.S. between 2002 and 2004. They exchanged past production information and market information, including CRT prices. 05 February 2013, Deposition of Ayumu Kinoshita, Volume I (Hereinafter "Deposition of Ayumu Kinoshita, Vol. I, 05 February 2013"), at 77:11 - 79:2 and 142:10 – 143:18
- Hitachi discussed jumbo CPT prices with Philips in 2001 and planned to hold a follow-up meeting between the two companies in Detroit. Heiser, Tom, 07 March 2001, E-mail, Subject: SEMEX, HEDUS-CRT00000578, at 0578.
- Samsung met with Philips in the U.S. in 2001 and discussed competitor pricing. Samsung SDI, Im, Cheol Hong, 06 June 2001, Philips CPT meeting Report, SDCRT-0002582, at 2582E.
- Samsung Mexico met with Toshiba in Chicago in 2001. They discussed capacity utilization and current prices of 32VF and 36VF tubes. Samsung SDI, 11 October 2001, Meeting Report, SDCRT-0069086, at 9086E.
- LPD exchanged information with Samsung in the U.S. in 2002. They discussed production, capacity, and pricing. Canavan, Pat, 04 March 2002, E-mail, Subject: Information on SDI, PHLP-CRT-097351 - PHLP-CRT-097352, at 7351 - 7352.
- Samsung met with LPD in the U.S. in 2003 and discussed current and forecasted CPT prices. Samsung SDI, 10 March 2003, LPD, SDCRT-0002588 - SDCRT-0002589, at 2589E.
- Samsung Mexico exchanged information with Thomson in 2003. Thomson told SDI that there will be no additional price cutting. Kim, Woong-rae, 02 May 2003, E-mail, Subject: Exchange of Information on Thomson CRT, SDCRT-0007239 - SDCRT-0007241, at 7239E.
- Samsung met with LPD, Thomson, and MTPD at the 2004 Consumer Electronics Show in Las Vegas. The companies expressed concerns about price cuts. Samsung SDI, 07 January 2004, 2004 International CES Business Trip Report (Jan. 7 - 14), SDCRT-0005180 - SDCRT-0005189, at 5183E - 5184E.
- MTPDA met with Samsung America in 2004. The companies discussed North American supply and demand, 27VPF CPT pricing for Mexican customer PAVCA, and price increases of the 20VPF CPT.

market.[235] The Defendants also indicated their North American collusion was intertwined with the cartel meetings involving their headquarters.[236]

Fujita, Norio, 01 April 2004, E-mail, Subject: (Please destroy after reading) SDI America, MTPD-0027035 - MTPD-0027037, at 7035E - 7036E.

- MTPDA met with LPD in in 2004. The meeting notes say, "Pat [of LPD] is very determined to raise prices in the market." Iwamoto, Shinichi, 02 April 2004, E-mail, Subject: FW: Meeting with Pat Canavan, MTPD-0025720, at 5720.
- LPD met with Samsung and Thomson at a "USA Roadshow" in 2004 and discussed CPT production. Thomson also discussed pricing policies with LPD. LG Philips Displays, November 2004, Evaluation USA Roadshow, PHLP-CRT-023515 - PHLP-CRT-023521, at 3516 - 3517.
- MTPDA exchanged information with Samsung North America in 2005. They discuss limiting MTPDA's price cuts for its 32V [32 viewable inches] tube in order to protect the price of SDI's 30VW [30 viewable inches, widescreen] tube. The notes also mention that the 27VPF [27 viewable inches, pure flat] has become more stable "since the three companies [Thomson/Videocon, LPD, and SDI]…are mutually not over-extending themselves". Tsuruta, Shinichiro, 24 August 2005, E-mail, Subject: Re: SDI North America Information, MTPD-0303225 - MTPD-0303228, at 3228E.
- MTPDA exchanged information with Samsung North America in 2005. The information included production situations and market prices. Fujita, Norio, 02 December 2005, E-mail, Subject: Information Exchange with SDI North American Sales (Handle with Care), MTPD-0291761 - MTPD-0291762, at 1761E - 1762E.

[235] See, e.g.,

- An e-mail from an employee at Samsung's American branch with the subject line "Progress status of the price increase for clients in North America" reads: "Our strategy to increase the price… [Bullet] Strengthen the cooperation among CPT companies: If only SDI alone moves to raise the price, it would be more difficult to raise the price and it is more likely that we might face revenge attacks later. Thus we should move with all the other CPT companies and need assistance from the headquarters in this regard." Oh Sung Kwon [SDI], 24 March 2000, Progress status of price increase for clients in North America, SDCRT-0079381 - SDCRT-0079383, at 9381.
- Notes from a meeting between Samsung, LG, Orion, Philips, and Chunghwa indicate that participants discussed NAFTA pricing and that "Mr. Chairman later requested [Philips] Mr. Corsino to keep contact with SDI/OEC personnel stationed in Mexico in order to exchange market and customer information." Chunghwa Picture Tubes, LTD, 14 April 2000, Visitation Report (Submit), CHU00030995 - CHU00030997, at 0996.02E.
- Notes from meeting in the U.S. between Samsung Mexico and the president of Philips Display Components, North American region, say, "It would be good if cooperation on price among companies in the CPT industry would be considered after checking Thomson's policy on price in the second half. It was agreed that a cooperation meeting between SDI and Philips would be held in our company's plant in Mexico since the locations of Mexico and Brazil regions are safe, and the first meeting would be held around September 29." Im, Cheolhong, 28 July 2000, Report on PHILIPS CPT Business Trip, SDCRT-0002506 - SDCRT-0002510, at 2506E.
- Notes from a meeting in Mexico between Samsung Mexico and the president of Philips Display Components, North American region, show that the two companies discussed maintaining and increasing the prices of 25V [25 viewable inches] and 27V [27 viewable inches] CPTs in 2001. The notes also appear to show that Philips gave SDI its entire business with Samex (TV manufacturer) in exchange for SDI reducing its tube supply to Philips TV. Samsung SDI, 29 September 2000, Philips Meeting, SDCRT-0002488 - SDCRT-0002489, at 2488E.
- An LPD e-mail describes a meeting with Samsung and Toshiba. Regarding the 34"RF [real flat] tube, the meeting description says, "Toshiba USA … will increase its output, decreasing [curved screen] production.

They say they sell it at U$330 and have no intention to drop the price. Their first priority customer is Toshiba-TV. I strongly talked them that there is no reason to reduce its price to such a low level. => Our MK-II of Gomez [in Mexico] should have cost competitiveness". Philips, Lee, Phil PJ, 30 May 2002, E-mail, Subject: Information for SDI and Toshiba, PHLP-CRT-014272, at 4273.

- From an internal Matsushita e-mail: "Regarding the above-captioned matter, there was a telephone call from Toshiba CRT today (Mr. Sanogawaya took the call), and information regarding the North American market for 32 V [32 viewable inches] was exchanged. During this conversation, it was mentioned that there is a shortage of 32V product and the price is not going to decline as the year comes to a close, so [Toshiba] would definitely like to have [us] maintain the price. [Toshiba] is particularly concerned about the Sharp price, and they also know that MDDA obtained the Sharp Project, and [we] were told regarding the price that they would like for us not to lower the price more than the offering price even if Sharp requests it." Yasuki, Tomori, 13 June 2002, E-mail, Subject: New Document, MTPD-0024384, at 4384E.
- Notes from a meeting between Samsung, LPD, and Toshiba indicate that Samsung is "[s]eeking the cooperation with LPD in the US". SDI was planning to contact LPD in Mexico and meet with LPD's Chief Sales Officer at the Consumer Electronics Show in the U.S. Samsung SDI, 06 December 2002, 3 Companies MTG Information (5th) - Result Report, SDCRT-0087934 - SDCRT-0087937, at 7937E.
- A trip schedule shows Samsung Mexico meeting with LPD and Thomson's CPT division on 10 March 2003, probably in San Diego, regarding "Americas market cooperation and information exchange". SDI Mexico was meeting with MDDA the following day. Samsung SDI, 26 February 2003, Mexico Trip Schedule, SDCRT-0076954 - SDCRT-0076956, at 6954E.
- This schedule is an attachment to an e-mail that says, "3/3 - 3/11 (9 days): Visit with major customer and competitor companies…. Competitor companies: LPD, Thomson, Matsushita (Americas market collaboration and information exchange)." Oh, Kyung Chul, 26 February 2003, E-mail, Subject: Mexico Corporation Business Trip Schedule (Transition), SDCRT-0076953, at 6953E.
- Notes from SDI's meetings with LPD, Thomson, and MTPD at the 2004 Consumer Electronics Show in Las Vegas say, "Competitors are having trouble in operating lines and indicated great concern about the price cut of large and jumbo sized models. They are desperately seeking collaboration among the companies for survival." Samsung SDI, 07 January 2004, 2004 International CES Business Trip Report (Jan. 7 - 14), SDCRT-0005180 - SDCRT-0005189, at 5185E.
- An MTPD e-mail describes meeting with Thomson and LPD at the 2004 Consumer Electronics Show in Las Vegas: "Please note that we met with competitors (Thompson, LPD) as well, but the points were that (1) price should be maintained (2) operations in Europe and America are tough and (3) we should move forward with mutual non-aggression with regards to captives." Iwamoto, Shinchi, 14 January 2004, E-mail, Subject: RE: Opinions-- CE Show, MTPD-0042738 - MTPD-0042740, at 2739E.

[236] See, e.g.,

- "Based on December meeting at headquarters, there was a subsequent meeting for purposes of finding grounds for cooperation within the North American market…" Im, Chul Hong, 12 January 1999, North America CPT companies meeting summary, SDCRT-0002526 - SDCRT-0002528, at 2527E.
- "Thus we should move with all the other CPT companies and need assistance from the headquarters in this regard." Oh Sung Kwon [SDI], 24 March 2000, Progress status of price increase for clients in North America, SDCRT-0079381 - SDCRT-0079383, at 9381
- "I think we can move the negotiation for CPT price forward with advance due to tight demand and supply caused by shortage of bulbs. However, because the market will not turn around when only our company precedes, I think it is important to create an atmosphere 'CPT price will increase??' in the market. [break] ** I am thinking of starting to make the atmosphere of 'CPT price going up next year??' due to shortage of bulbs by visiting TV clients here from May to June. ** I request Headquarter to obtain information of the status of demand and supply of bulbs in the next and following years from Bulb suppliers. (Particularly, in each region) I also want to ask TDD [Toshiba Display Devices in Horseheads, New York] to obtain the expected status of demand and supply of bulbs in North America from local Bulb suppliers. ** I also want

Defendants' North American and other subsidiaries sought pricing guidance and approval from Defendants' headquarters in Asia. Indeed, there is significant evidence that many Defendants' headquarters were able to influence, or even set, the prices at which their North American and other subsidiaries sold CPTs to customers.

[redacted] LG's headquarters provided price guidelines for its North American and other regional subsidiaries.[238] LPD's Chief Sales Officer at headquarters provided global price guidelines to its regional sales offices.[239] Pricing at MTPD's North American and other regional subsidiaries was done

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to request Headquarter to contact competitive manufacturers of CPT (MEC [Matsushita], HITACHI, Sony) to know their directions for taking measures in North America next year." Tukunaga, Seiichi, 12 May 2000, E-mail, Subject: A scenario expecting shortage of cpt bulb (?) in North America, TSB-CRT-00039194 - TSB-CRT-00039196, at 9195E.

- An LPD internal e-mail about a meeting among LPD, Samsung, and Toshiba concludes "Dear AM [Americas] and EU colleague, Please let me know if there is anything we have to talk with SDl and Toshiba at global level. We will get together comming [sic] July in Japan. And I can keep in touch with them from time to time by mail or phone." Philips, Lee, Phil PJ, 30 May 2002, E-mail, Subject: Information for SDI and Toshiba, PHLP-CRT-014272, at 4273.

[redacted]

[238] A slide titled "Comparison of HQ's sales functions between AP [Asia Pacific] and Other regions" from an LG presentation indicates that LG's headquarters handled all aspects of sales for the Asia Pacific, and handled price guidance, allocation, and inter-regional sales coordination for America, Europe, and China. A later slide titled "A/P Sales Mission & Roles" from an LG presentation lists "Regional Price Decision in line with Global Price Guidelines" as one of the roles of LG's Asia Pacific sales organization. Undated, AP Sales Organization (Draft), LGE00009918, at 5-6.

[239] See, e.g.,

- A "Demand Generation Process" document from LPD headquarters indicates that the CSO [Chief Sales Officer] at headquarters is the "final decision maker" in preparing global price guidelines per product size and communicates guidelines to Key Account Managers and regions. LG Philips Displays, 02 April 2003, Demand Generation Process, FOX00034021 - FOX00034082, at 29-31.

according to business plans created by top management at headquarters,[240] and regional price quotes needed approval from headquarters whether they were below or above the business plan bottom prices.[241] Philips had "Commercial Council Meetings" of regional CPT marketing and sales managers to discuss, among other things, pricing policies in North America and other regions.[242] Philips documents also show regional subsidiaries receiving price guidance from

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- From an LPD presentation slide titled "Roles in the organization": "Headquarter Functions in CSO [Chief Sales Officer] [Bullet] CSO leadership and integration of global plans across functions [Sub-bullet] Global allocation (co-op with COO) [Sub-bullet] Global pricing (global sales co-ordination, CFO analysis, COO cost structures, BI) [Bullet] Global business development [Sub-bullet] Align/co-ordinate customer account plans and policies." LG Philips Displays, 12 April 2005, LPD sales organization focus on global account management, PHLP-CRT-009518, at 7, emphasis added.

[240] "[Q.] Who's in charge of setting the bottom price? A. I'm not sure if I'm answering your question the -- precisely, but as I mentioned, the idea about the price is submitted by the sales, and the other departments or divisions submit their numbers, too. And after all of those are authorized, then the – in the end, the price that appears in the authorized plan becomes the – that bottom price. And the business plan itself is approved by the top management of the MTPD…. Q. Okay. And who – so who is it that uses all this information to set the bottom price? Is it the company's top management? A. Top management approves the entire business plan, and since the price is a part of it, in that sense you could understand that the top management is the one who approves the – approves it too." 17 July 2012, Deposition of Panasonic Corporation, Panasonic North America and MTPD 30(b)(6) Witness Hirokazu Nishiyama, Volume I (Hereinafter "Panasonic 30(b)(6) Deposition of Hirokazu Nishiyama, Vol. I, 17 July 2012"), at 71:2 - 71:25.

[241] See, e.g.,

- According to an MTPD document, MTPD's new product prices must be approved by the President of MTPD (Mr. Tobinaga) if the decision may affect the whole MTPD group operation. Other new product prices must be approved by the Director of the Operation Business group (Mr. Shimoma). MTPD's current product prices must be approved by the Director of the Operations Business group (Mr. Shimoma) and the Director of Regional Division (Mr. Matsuda for MTPDA and MTPDG, Mr. Shimoma for Asian companies) if the offered price is lower than business plan. If the offered price is within the business plan, current product prices must be approved by the Director of Regional Division (Mr. Matsuda for MTPDA and MTPDG, Mr. Shimoma for Asian companies). MTPD, 05 October 2004, Request for cooperation to MTPDG, MTPD-0400021.
- "Q. BY MR. LAMBRINOS: If the salesperson doesn't think he can – he or she can get the business at the bottom price, can he depart from the bottom price and go below it? A. Yes. Q. What would the procedure have been for such a thing? A. In case it was not possible to get a business without offering the price that was below the price in the business plan, and if that business is an important business, then the salesperson could start what's called the price -- price decision form and obtain the top management's approval." Panasonic 30(b)(6) Deposition of Hirokazu Nishiyama, Vol. I, 17 July 2012, at 77:16 - 78:14.
- A pricing approval form from MTPD (Indonesia) shows seals of approval from high-ranking managers at MTPD headquarters. MT Picture Display, Undated, Approval of Sales Price, MTPD-00653133 at 3133.
- Mr. Nishimaru of MTPD (Thailand) testified that he had to consult Mr. Nishiyama at headquarters when making price responses: "Q. Did Mr. Nishiyama have pricing authority for CRTs? [objection omitted] THE WITNESS: The image wasn't – or the – the image was not that Mr. Nishiyama had pricing authority on his own. BY MS. ROSENBERG: Q. He had some responsibility for pricing? [objection omitted] THE WITNESS: I think he was one of the people who needed to be consulted when making price responses. However, I don't have the impression that Mr. Nishiyama had pricing authority." 27 June 2013, Deposition of Kazuhiro Nishimaru, Volume II (Hereinafter "Deposition of Kazuhiro Nishimaru, Vol. II, 27 June 2013), at 233:17 - 234:8.

[242] See, e.g.,

headquarters.[243] Samsung headquarters provided price guidelines for its North American and other regional subsidiaries in the form of a three-month rolling profit-and-loss plan;[244] prices below the rolling plan's target prices had to be approved by headquarters.[245] Toshiba

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- From a Briefing Strategy Review: "The 'Smart' project is aimed at improving our competence in all key processes at the customer interface. This has to result in a more proactive product policy integrated with the needs of our key customers. This also requires a consistent policy w.r.t. [with respect to] customer portfolio, target marketing and pricing policy…. The nature of other global accounts such as Sharp and JVC and Sanyo needs to be better understood, in so far as it affects global/regional purchasing decisions. Nevertheless, a more transparent overview of key global/regional accounts will be followed up in the next Commercial Council." Wilkes, John, 05 February 1999, Subject: Strategy Review 1999 - 2003, FOX00050659 - FOX00050689 at 4.
- An action plan from an October 2000 Commercial Council Meeting shows a due date of November 2000 for "Global TVT [TV tubes (CPTs)] pricing analysis + Guidlines [sic]". Philips, 26 October 2000, Action List Commercial Council Meeting October 26/ 27 in Amsterdam, PHLP-CRT-029673 - PHLP-CRT-029674, at 9674.

[243] See, e.g.,

- From an internal e-mail concerning price quotations from Philips' Singapore sales office to customer LoBTV: "These prices are based on DC [headquarters] view of AP market price, which has been reviewed with all regions via Anton [from headquarters], where as in the price agreement it is stated that we would use LoBTV input for the market price." Tyson, Mike, 15 April 1998, E-mail, Subject: LoBTV Asia Pacific Price quotation for Q2., PTC-00008572 - PTC-00008573, at 8572.
- A February 1999 e-mail from Philips headquarters to regional managers has price guidelines for 14" and 20" CPTs for Asia Pacific, North America, Europe, and South America. Philips, Undated, EIN0109551, EIN0109551 - EIN0109996, at 9841 - 9842.
- Philips Display Components (PDC) North America is subject to global pricing policy for its strategic account, which is PCEC (Philips Consumer Electronics). PCEC accounted for over 40% of PDC North America sales in 1999. Philips, September 1999, Philips Display Components Company NAFTA Sales Strategy, PTC-00001149, at 9 - 10, 27.

[244] See, e.g.,

- "Q. Was – was the dispatched employee giving any sort of guidelines as to how to price a product, or was this employee allowed to do whatever they wanted? [objection omitted] THE WITNESS: There are like midterm or long-term goals in our company, in our company's operation plans. So as I mentioned, we have a target for each three months. And we call it the rolling plan, and we have a target in terms of profit and loss. So if the goal – the target can be met, then decisions can be made locally in the region. But if the customer's demand in terms of pricing is so – is [too low] to be dealt with locally or that local market fluctuated so much and that it affects the profit and loss to the extent the local dispatched employee cannot handle, then – then that dispatched employee would check with the headquarters and have a discussion and – discussion, and then a decision will be made." Samsung SDI 30(b)(6) Deposition of Jaein Lee, Vol. II, 07 June 2012, at 186:4 - 186:25.
- A Samsung user manual for creating rolling plans shows that local sales members input prices and headquarters sales members confirm the prices. Samsung SDI, August 2005, APS Rolling Plan User Manual (Functional), SDCRT-0054114, at 1.
- An internal Samsung e-mail shows that the plants enter CPT/CDT quantity and price into the rolling plan, and then headquarters adjusts quantity and price as needed. Choi, Jinyong, 13 May 2007, E-mail, Subject: '07.MAY Rolling Plan SKDL('07.MAY - '07.DEC), SDCRT-0033533 - SDCRT-0033534, at 3533.

[245] See, e.g.,

- "Q. All right, during 1996 through 1999 when you were selling CPTs and CDTs, produced in the Malaysian plant, who had the final authority to set – to approve the prices at which you would make sales?

headquarters consulted on North American and other regional pricing decisions and provided price plans for its regional subsidiaries through its CPT Overseas Sales Group.[246] This evidence of centralized pricing at the Asian headquarters, in combination with the rest of my analyses, means that the cartel influenced the prices of CPTs and CRT TVs sold in the U.S.

Defendants were well aware that their actions in Asia, North America, and elsewhere directly impacted pricing of both CPTs and CRT TVs that were produced or consumed in North America.[247]

[objections omitted] THE WITNESS: To explain more specifically about this they – there could be various cases. For instance, let's say that I met a customer who asked for a price discount. If the depth of the price discount is at a level that I can decide on I might make a decision to give the discount, but if it's too deep I could report it to the general manager in charge of sales at the headquarter or in any other – in other cases, if sales people below me meet with customers and those customers ask for a price discount and that is at that level that could be determined or decided by those people themselves, they could make that decision themselves. So, there could be various instances and possibilities which is why it is difficult for me to tell you exactly one person who makes the decision." 20 March 2013, Deposition of Sang-Kyu Park, Volume I (Hereinafter "Deposition of Sang-Kyu Park, Vol. I, 20 March 2013"), at 33:2 - 34:1.

- "Q. So in those instances where there'd be requests for, I think you termed it excessive pricing, excessive price drop, the process was for the dispatched employee to contact someone at headquarters regarding that customer's request; is that accurate? A. Yes, that's correct. Q. Was there a particular contact person at headquarters during the period 1998 to 2006 who dealt with questions like that? [objections omitted] THE WITNESS: Basically when you look at our company's organization, it's done by the customer. So – and in here, too, in North America and Mexico there is – there is a person who is in charge of the customers, so the – the person at the headquarters who was in charge of the customer would be contacted. But if the price drive is too hard and the price has to go down too much, then the discussion will be made with the CPT team leader." Samsung SDI 30(b)(6) Deposition of Jaein Lee, Vol. II, 07 June 2012, at 277:2 - 22.

[246] See, e.g.,

- "[Q.] At Toshiba Thailand, what was the process for setting prices for CDTs while you were there? ... A. Here again, there were many different cases. There were times when -- when the decision was made in consultation with my superior, cases where the president of TDDT would be consulted, and in parallel there are cases where consultation occurred with the sales group, CRT sales group in Japan. There are different cases.... BY MS. ROSENBERG: Q. At some point you also took responsibility and were involved with CPT sales, correct? [objection omitted] THE WITNESS: I became in charge of CP -- in charge of the sales of CPTs at TDDT in January of 2003.... Q. In any event, when you became involved with CPT sales in 2003, is it your recollection that pricing decisions were made similarly to the decisions that -- the way decisions were made about pricing CDTs? [objection omitted] THE WITNESS: I think so." 26 June 2013, Deposition of Kazuhiro Nishimaru, Volume I (Hereinafter "Deposition of Kazuhiro Nishimaru, Vol. I, 26 June 2013", at 82:21 - 87:20, emphasis added.
- An organization chart for Toshiba headquarters shows a CPT Overseas Sales Group. It indicates that the deputy manager for this group is responsible for the budget, forecast, midterm plan, and price control for America, Europe, Asean, the Middle East, and East Asia, as well as sales support for TDD, TDD (Thailand), and TDD (Japan). 01 October 2001, Organization of CRT Sales & Marketing Dept., TAEC-CRT-00084530, at 4530.0002.

[247] For example, notes from an October 27, 1999 meeting read: "Price-up trend [of small and medium CPTs] in European & American market thanks to capacity reduction in Asia." Chunghwa Picture Tubes and LTD, 27 October 1999, Visitation Report, Topic: Exchange of Market Information and Price Review, CHU00030899 - CHU00030903, at 0902E. For context, see, e.g.,

- Notes from a 26 September 1998 meeting, "In order to stabilize price for this over-supplied market, a simulated adjustment of each maker's Q4 [1998] production volume plan is as follows." The notes then

B. The cartel overcharge was passed on to class members

Above I showed that the impact of the cartel was to raise the price of tubes to direct customers; that is, direct customers were harmed by the cartel by paying higher prices for CRTs than they otherwise would have. In order for class members (end consumers) to have been harmed by the cartel via higher prices for CRT products, at least some portion of the overcharge imposed on direct purchasers must have been passed down the distribution chain to class members.

To determine whether cartel CRT prices were passed through to indirect purchasers, I first reviewed the economic theory of pass-through. Next, I reviewed documentary evidence that showed that Defendants expected resellers of CRT products to pass through cost changes. These documents also established that Defendants routinely monitored the street, or retail, prices of CRT products. Street price monitoring underscores that Defendants were aware of the connection between the tube price charged to direct purchasers and the amount paid by class members for computer monitors and TVs that contain tubes.

My review of these materials led me to conclude that at least some portion of the cartel overcharge was passed through to class members: CRT product prices (i.e., the amount class members pay) increase when CRT prices (i.e., the amount direct purchasers pay) increase. In other words, all class members were harmed by the cartel. I conducted 62 studies to quantify the magnitude of pass-through; see Section X. Those results – that every pass-through estimate was 100% or more – are further support for my conclusion here that the overcharge was passed through to class members.

1. Economic theory supports pass-through of the cartel overcharge

Economists routinely study the impact of changes in costs (in this case, a change in the cost of a CRT) on prices (in this case, the price of a product containing a CRT) theoretically and empirically. Economists refer to the concept of changes in upstream costs leading to changes in downstream prices as "pass-through" (also sometimes called "pass-on"). The pass-through rate

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detail the quantity reductions of 14" and 20"/21" CPTs for each maker. Chunghwa Picture Tubes and LTD, 26 September 1998, Visitation Report, Topic: 14"/20"/21" CPT Supply/Demand and Price Comment Review, CHU00029262 - CHU00029264, at 9264.01E.

- Notes from a 27 November 1998 meeting, "In an overall view of Q1 [1999], all makers are taking action to reduce production according to order status so no further discussion was conducted on this topic." The targeted products are 14", 20", and 21" CPTs. Chunghwa Picture Tubes and LTD, 27 November 1998, Visitation Report (Submit), CHU00029259 - CHU00029261, at 9261.01E.
- Notes from a 20 May 1999 meeting describe the number of production lines reduced by each maker for 14" and medium-sized CPTs in Q1 1999. Supply and demand forecasts show overcapacity declining as the year progresses. Chunghwa Picture Tubes and LTD, 20 May 1999, Meeting Minutes, Meeting Subject: CPT Top Management Meeting, CHU00029191 - CHU00029194, at 9193E.
- Notes from a 24 January 2000 meeting indicate that 14" CPT capacity was reduced 5.1% in 1999 and 20"/21" CPT capacity was reduced 9.8% in 1999. Chunghwa Picture Tubes and LTD, 24 January 2000, Visitation Report, CHU00029152 - CHU00029154, at 9153E.

quantifies the degree to which output prices change when costs change.[248] For example, a pass-through rate of 110% means that when costs increase by $1, prices increase by $1.10.[249]

Pass-through can occur at each stage of the manufacturing and distribution process. As an example, consider gasoline. An increase in the price of crude oil, the primary input into gasoline, can cause an increase in the price of wholesale gasoline, which can cause an increase in the rack price of gasoline (the amount paid by gas stations), which, in turn, can cause an increase in the price of gasoline at the pump. Scholarly studies have shown that changes in the cost of crude oil (at the top of the distribution channel) are passed-through to consumers of gasoline (at the bottom of the distribution channel).[250]

A fundamental result in economics is that firms increase price when faced with an increase in cost. The incentives to increase price in response to a cost increase are stronger when the cost increase affects more of the firms that purchase the product, the longer the cost increase is expected to last, and the higher is the cost increase. Pass-through occurs regardless of the market structure of the industry facing the cost increase. While the magnitude of pass-through depends on the market structure and the shape of demand for the product, pass-through occurs.

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[248] E.g., if a $50 increase in cost causes price to increase by $55, then the pass-through rate is 110% ($50 × 110% = $55). Mathematically, the pass-through rate is the partial derivative $\partial p/\partial c$, where p represents price and c represents cost.

[249] There is another relationship between cost and price that is sometimes confused with pass-through called mark-up. The mark-up rate refers to the average relationship between cost levels and price levels. It is calculated as total price divided by total cost. The mark-up rate is a relationship between price and cost levels, and the pass-through rate refers to the relationship between cost and price changes.

[250] See, e.g.,

- Balke, N.S., S.P.A. Brown, and M.K. Yucel, 1998, Crude Oil and Gasoline Prices: An Asymmetric Relationship?, Federal Reserve Bank of Dallas Economic Review, 2-11.
- Blair, Benjamin F. and Philip A. Mixon, June 2011, Price Pass-Through in U.S. Gasoline Markets, Working Paper.
- Chouinard, Hayley H. and Jeffrey M. Perloff, 2007, Gasoline Price Differences: Taxes, Pollution Regulations, Mergers, Market Power, and Market Conditions, The B.E. Journal of Economic Analysis & Policy Vol. 7 Iss. 1.
- Dale, Charles, John Zyren, et al., February 1999, Price Changes in the Gasoline Market: Are Midwestern Gasoline Prices Downward Sticky? Energy Information Administration.
- Godby, R., A.M. Linter, et al., 2000, Testing for Asymmetric Price Responses in the Canadian Gasoline Market, Energy Economic, Vol. 22, 349-368.
- Kirchgassner, Gebhard and Knut Kubler, 1992, Symmetric or Asymmetric Price Adjustments, Energy Economics, Vol. 14, 171-185.
- Radchenko, Stanislav, 01 June 2005, Lags in Response of Gasoline Prices to Changes in Crude Oil Prices: The Role of Short-Term and Long-Term Shocks, Energy Economics, 27, 573 - 602.
- Reilly, B. and R. Witt, 1998, Petrol Price Asymmetries Revisited, Energy Economics, Vol. 18, 297-308.
- Shin, David, December 1992, Do Product Prices Respond Symmetrically to Changes in Crude Prices?, American Petroleum Institute, Research Study #068, 137-157.
- Weinhagen, Jonathan, July 2003, Consumer Gasoline Prices: An Empirical Investigation, Monthly Labor Review, Vol. 126(7), 3-10.

a) Pass-through in a textbook model of perfect competition

The textbook definition of a perfectly competitive market is one in which there are many buyers and sellers, none of which can affect prices in any significant manner. There are no barriers to entry or exit, so firms can enter or exit the market freely. Buyers and sellers have perfect information; that is, they have perfect knowledge of product quality, price, and availability. The products being sold are homogeneous goods, meaning there is no difference in quality (perceived or actual) between various suppliers and thus buyers buy from the cheapest source. Neither buyers nor sellers incur any transaction costs when exchanging goods.[251] These conditions mean that sellers in a perfectly competitive market can instantaneously react to any changes in cost, regardless of whether the change is temporary or whether it is small. That is, sellers can make perfect adjustments to respond to market changes. Under these textbook conditions, economic profits are zero in the long-run.[252] If economic profits were negative, firms would go out of business, causing prices to rise until economic profits returned to zero; if economic profits were positive, firms would enter, causing prices to decline until profits returned to zero.

Now consider an industry-wide cost increase that impacts all of the perfectly competitive firms. Any perfectly competitive firm that did not pass through the higher input costs would earn negative economic profits on all its sales, since its costs would be greater than its price, and would eventually go out of business. Not passing through cost increases would mean the firm would lose money on each unit sold, which is not a rational long-term strategy for a profit-maximizing firm.[253] Thus, all perfectly competitive firms would charge a price that covered the increase in cost. An industry-wide cost increase results in higher prices across the board.[254]

Now consider a cost change that is not industry-wide. If one of the perfectly competitive firms faced with the cost increase raises its price, it will lose all its sales; its customers will all switch to firms that do not face the cost increase and that are therefore continuing to charge the original price. In this case the firm will go out of business, which is also what it would do if it kept charging the original price, because its costs would be greater than its revenues.

Suppose that the perfectly competitive market also displays an economic characteristic known as "constant costs", which means the market can grow to any size without driving up the costs of its

[251] Agriculture markets are often considered nearly perfectly competitive. In the market for wheat, for example, there are thousands of sellers (farmers producing wheat) and thousands of buyers who produce flour and other products. In the wheat market, no individual seller or buyer can significantly affect the price of wheat. Pindyck, Robert S. and Daniel L. Rubinfeld, 2005, Microeconomics: Sixth Edition, Prentice Hall: Upper Saddle River.

[252] A firm's profitability can be measured using either accounting profit or economic profit. Accounting profit is a firm's revenues minus the total costs of producing goods or services including labor, raw materials, and interest plus depreciation expenses. Economic profit is a firm's total revenue minus the total opportunity cost of the inputs. Therefore, economic profits, unlike accounting profits, consider the return a firm would earn it its capital were used elsewhere. Pindyck, Robert S. and Daniel L. Rubinfeld, 2005, Microeconomics: Sixth Edition, Prentice Hall: Upper Saddle River, at 283.

[253] Firms may elect to temporarily sell products below cost. See Section VIII.B.1.b)(5) for a discussion of why these pricing aberrations are not inconsistent with positive pass-through.

[254] Pass-through is zero under perfect competition in the unrealistic case where demand is perfectly elastic. Perfectly elastic demand falls to zero if price increases at all, even by a penny. If demand were perfectly elastic and costs increased, all firms would go out of business and the market would disappear because the value of the good (how much consumers are willing to pay for it) is less than the cost of producing the good.

inputs.[255] In this case, the long-run pass-through rate of an industry-wide cost increase is 100%, which means that if costs rise by $1, prices also rise by $1.

Economic theory establishes that when an industry is perfectly competitive, the pass-through rate of an industry-wide cost increase is positive;[256] and, when the industry displays constant costs, the pass-through rate is 100%.[257]

b) Pass-through in the real world

As explained above, economic theory establishes that under the extreme conditions of a constant cost, perfect competition, industry-wide cost changes are completely passed-through. Similarly, under these extreme conditions, cost increases that are not industry-wide cannot be passed-through at all; firms experiencing the cost increase ultimately go out of business, firms not experiencing the cost increase survive, and price remains the same. While the textbook conditions of perfect competition are informative to understanding the actual world, no industry—including that for the production and distribution of CRT products—is perfectly competitive; therefore, in the real world, pass-through is not a binary construct where the pass-through rate is either 0% or 100% depending on whether the cost change is strictly industry-wide or not.

Markets also generally deviate from perfect competition in that there is not perfect information, zero transactions costs, and no barriers to entry or exit. Given these deviations from the textbook perfectly competitive model, prices may not be uniform across all products, firms, consumers, and time. Pass-through is fully consistent with a variety of pricing practices that may be present in the distribution of CRTs and CRT products. Specifically, pass-through occurs even when firms have some influence on price, it is costly to change prices, cost changes are non-transitory, there are multiple levels to the pass-through channel, there is price variation across firms and/or products, there is loss-leader or discount pricing, or there is focal point pricing.

(1) Pass-through when firms have influence on price

Imperfectly competitive or oligopolistic markets deviate from textbook models of perfect competition or monopoly in a variety of ways. The most obvious deviation is in terms of the number of competitors: there are not so many firms that each firm has no individual influence on price and there is more than one firm. With imperfect competition, the pass-through rate for

[255] For example, if unskilled labor is a major input in a firm's production, and the wage for unskilled laborers is unaffected by the increase in demand, then the firm can expand without incurring any cost increases. A practical example is if a new retail store opens in a large city, the new entrant pays the same wage as existing retail stores—the prevailing wage for store clerks remains unchanged.

[256] See, e.g.,

- Bishop, Robert L., May 1968, The Effects of Specific and Ad Valorem Taxes, Quarterly Journal of Economics, Vol. 82(2), 198-218.
- Kosicki, George and Miles B. Cahill, Fall 2006, Economics of Cost Pass Through and Damages in Indirect Purchaser Antitrust Cases, Antitrust Bulletin, Vol. 51(3), 599-630.

[257] Nicholson, Walter, 2005, Microeconomic Theory: Basic Principles and Extensions: Ninth Edition, South-Western: Mason, Ohio, at 296-299 and Stiglitz, Joseph E., May 1988, Economics of the Public Sector, 2nd edition, W.W. Norton & Company, at 417.

industry-wide cost increases is positive.[258] An imperfectly competitive firm recognizes that, when it shifts even a portion of its cost increase forward, the increase in price causes demand for its product to decline. Depending on how responsive demand is to changes in price, an imperfectly competitive firm may find it profitable to shift forward less or more than its cost increase;[259] that is, the pass-through rate may be less than or greater than 100%, respectively.[260]

[258] Fullerton, Don, and Gilbert E. Metcalf, 2002, Chapter 26: Tax Incidence, in Auerback, A.J. and M. Felstein (Eds.), Handbook of Public Economics, Vol. 4, Elsevier Science: Amsterdam, at 1823.

[259] When a firm increases its price in response to a cost increase, there are two effects on profits: (1) the firm's profit on each unit sold changes and (2) the firm sells fewer units. While the second effect always causes the firm's profits to fall, the first effect may cause the firm's profit per unit sold to rise or fall. The decline in sales is sufficient that the firm's profits always fall when costs increase; the firm mitigates the extent of the profit decline by increasing its price.

Suppose that a firm passes through less than 100% of a cost increase. In that case, its profit on each unit sold declines and it sells fewer units, but the loss in sales is smaller than it would be if the firm passed on 100% or more of a cost increase. When the firm is earning economic profits, the firm can account for the higher costs in part by passing some of the cost increase on to consumers and in part by reducing its profit margin. If a firm passes through more than 100% of a cost increase, then it still sells fewer units, but its profit on each unit sold increases. The increase in profits per unit mitigates the decline in profits caused by the decline in volume sold. The pass-through rate is less than 100% when the change in price reduces quantity sufficiently that it would offset the increase in profits per unit if price rose by more than the cost change. Fullerton, Don and Gilbert E. Metcalf, 2002, Chapter 26: Tax Incidence, in Auerback, A.J. and M. Felstein (Eds.), Handbook of Public Economics, Vol. 4, Elsevier Science: Amsterdam, at 1825.

[260] Empirical studies have found positive pass-through rates of less than, greater than, and equal to 100%. I am aware of no study published in a peer-reviewed journal that has found a pass-through rate of zero.

For estimates of pass-through rates less than 100%, see, e.g.,

- Balke, N.S., S.P.A. Brown, and M.K. Yucel, 1998, Crude Oil and Gasoline Prices: An Asymmetric Relationship?, Economic Review.
- Delipalla, Sophia and Owen O'Donnell,, 2001, Estimating Tax Incidence, Market Power and Market Conduct: The European Cigarette Industry, International Journal of Industrial Organization, 19, 885 - 908.
- Duffy-Denno, K.T., 1996, Retail Price Asymmetries in Gasoline Local Markets, Energy Economics, Vol. 18.
- Nakamura, Emi and Dawit Zerom, 2010, Accounting For Incomplete Pass-Through, The Review of Economics and Statistics, Vol. 77, No. 3, 1192-1230.

For estimates of pass-through rates greater than 100%, see, e.g.,

- Carbonnier, Clement, 2013, Pass-through of Per Unit and ad Valorem Consumption Taxes: Evidence from Alcoholic Beverages in France, The B.E. Journal of Economic Analysis & Policy.
- Doyle, Maura P., July 1997, The Effects of Interest Rates and Taxes on New Car Prices, Board of Governors of the Federal Reserve System Finance and Economics Discussion Series 1997-38.
- Karp, Larry S. and Jeffrey M. Perloff, 1989, Estimating Market Structure and Tax Incidence: The Japanese Television Market, Journal of Industrial Economics; Vol. 37(3), 225-239.
- Young, Douglas J. and Agnieszka Bielinska-Kwapisz, March 2002, Alcohol Taxes and Beverage Prices, National Tax Journal, 55(1), 57 - 73.

For estimates of pass-through rates equal to 100%, see, e.g.,

In imperfectly competitive markets, if a cost increase is imposed on some, but not all, resellers, it will be more difficult to pass-through those increases, but it will not be impossible as it is when a market is perfectly competitive. When the reseller passes through the cost change, at least some purchasers will choose to buy from those resellers that did not experience a cost increase and which can therefore charge a lower price than those firms that do face the cost increase. If the cost increase is industry-wide, resellers know that they can pass-through a larger portion of the cost increase because all other resellers will also increase prices. Therefore, as the cost increase becomes closer to industry-wide, the pass-through rate will approach 100% for all resellers.

(2) Pass-through when there is a cost to change price

In a perfectly competitive industry, there are no transaction costs, so prices can be instantaneously adjusted to account for cost changes no matter how small or how temporary they might be. In the real world, firms do face transaction costs. One type of transaction cost a firm may face is a cost to changing its price. For example, typically a restaurant that changes prices will need to print new menus. Economists call the cost of changing prices "menu prices", from this restaurant example. The costs associated with changing prices, referred to by economists as menu costs, include, but are not limited to, re-pricing merchandise, changing displays, and communicating the new prices to salespeople.

Thus, when a firm faces a cost increase, one thing it should consider is the cost increase (and its impact on profits if price doesn't change) versus the costs of changing price (and its impact on profits if price is changed). The magnitude of a cost change on profits relative to the menu costs determines whether or not a given cost change will be passed through.[261] The larger a cost change or the longer the cost change will last, the more likely the gain to profits from changing price will exceed the costs of changing price, and the more likely the cost change will be passed through.[262] Thus, relatively large (significant) and non-transitory cost changes will be passed

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- Bacon, R.W., 1991, Rockets and Feathers: the Asymmetric Speed of Adjustment of UK Retail Gasoline Prices to Cost Changes, Energy Economics, Vol. 13.
- Karp, Larry S. and Jeffrey M. Perloff, 1989, Estimating Market Structure and Tax Incidence: The Japanese Television Market, Journal of Industrial Economics; Vol. 37(3), 225-239.

[261] See, e.g.,

- Pollard, Patricia S. and Cletus C. Coughlin, July 2004, Size Matters: Asymmetric Exchange Rate Pass-Through at the Industry Level, The Federal Reserve Bank of St. Louis Working Paper Series, http://research.stlouisfed.org/wp/2003/2003-029.pdf.
- Ghosh, Atish and Holger Wolf, 2001, Imperfect Exchange Rate Passthrough: Strategic Pricing and Menu Costs, CESifo Working Paper, No. 436, http://www.econstor.eu/bitstream/10419/75783/1/cesifo_wp436.pdf.
- Nakamura, Emi and Dawit Zerom, 2010, Accounting for Incomplete Pass-Through, The Review of Economics and Statistics, Vol. 77, No. 3, 1192-1230.
- Gopinath, Gita, and Oleg Itskhoki, May 2010, Frequency of Price Adjustment and Pass-Through, The Quarterly Journal of Economics, 125(2) pp. 675 - 727.

[262] Costco testified that it passes through cost changes if it has no reason to believe they are temporary: "Q. […] In a situation where Costco's costs […] were significant […] and in a situation where Costco had no reason to believe that that cost change was temporary, would Costco necessarily increase its retail price on that product? [...] THE WITNESS: Well, if it's an item that we're going to continue to purchase at the higher cost, at some point we're going to have to make an adjustment […]. Q. BY MR. GRALEWSKI: And when you say make that adjustment,

through, whereas relatively small and short-term cost changes are less likely to be passed through. Therefore, the larger and longer the cost change, the more likely pass-through will occur.

Firms can choose not to pass-through the cost increase in the form of higher prices by earning a lower margin on those sales temporarily until the costs decrease again. However, as I show below in Section VIII.B.2.b), there is a high degree of competition in the production, distribution, and sales of CRT products, which implies that firms earn very low margins on these products; see Exhibits 53 and 54. As such, some firms may be able to temporarily absorb the cost increase, but for significant or permanent cost increases they will be far less able to do so, and will eventually pass-through the cost increase in the form of higher prices.

(3) Pass-through when there are multiple levels of distribution

Pass-through occurs at each stage of the manufacturing and distribution process. As described in Section VI.E, there are several stages in the distribution of CRT monitors and TVs: a CRT manufacturer sells to CRT monitor or TV manufacturer, the manufacturer sells CRT monitors or TVs to a retailer, and the retailer sells the CRT products to the end consumer. When the manufacturer faces an increase in the cost of inputs, it increases its price. Similarly, when the distributor (and its competitors) pays a higher price for the product, it also increases its price; this process continues throughout the entire distribution chain. One can calculate the pass-through rate at any single level of the distribution channel or over multiple levels. The pass-through rate from the top of the distribution channel to the bottom of the distribution channel, or the "channel-length" pass-through rate, is the product of the pass-through rates for each distribution level.

For example, consider an scenario in which Samsung, a CRT manufacturer, sells CRTs to BenQ, a company that makes CRT monitors using those same tubes, for $100. BenQ then sells the CRT monitors it makes from Samsung's CRTs to Best Buy, a retailer, for $115. Best Buy then sells the monitors to end-users for $120. Now suppose that Samsung increases the price it charges BenQ by 10%, resulting in a tube price of $110. Suppose that BenQ in turn increases its price to $130 and that Best Buy in turn increases its price to $135. The pass-through rate for BenQ is 150%[263] and the pass-through rate for Best Buy is 100%.[264] The channel-length rate is 150%, which is the product of the two pass-through rates, 150% × 100% = 150%.

One can also measure the impact of the cost increase imposed by Samsung on the price paid by final consumers in a single step. Using the same numerical example above, the channel-length pass-through rate can be calculated directly: the change in price to the end user is $15 (Best Buy raises its price for the monitor from $115 to $130) and the change in cost at the top of the

given the set of factors I indicated in my question, the adjustment would be upwards, correct? […] A. Yes. Because, in that example, if we kept the – the previous retail price, we would be at a negative margin, which is really against – it's against our company policy to – to sell things below cost. Yeah." 07 December 2012, Deposition of Costco Wholesale Corporation 30(b)(6) Witness Geoffrey Shavey (Hereinafter "Costco 30(b)(6) Deposition of Geoffrey Shavey, 07 December 2012"), at 122:15 - 124:5.

[263] Calculated as the change in price ($130 – $115) divided by the change in cost ($110 – $100).

[264] Calculated as the change in price ($135 – $120) divided by the change in cost ($130 – $115).

channel is $10 (Samsung raises its price for the CRT from $100 to $110);[265] therefore, the channel-length pass-through rate is 150%, which is $15 divided by $10. Thus, it is not necessary to estimate BenQ's and Best Buy's individual pass-through rates to determine the pass-through rate for a price increase imposed on direct purchasers on to the price that final consumers pay.

The channel-length pass-through rate calculation gives the same result whether it is calculated stage-by-stage or in a single step.

(4) Pass-through is consistent with different price levels

CRTs with the same specifications (or CRT products with the same specifications) may be sold at different prices by different resellers; however, the fact that prices are not the same does not indicate that pass-through differs—or does not occur at all—for these products. While the products may be sold at different prices, they are sold in distribution channels that are highly competitive and, therefore, the pass-through rate will be similar across firms and will be close to 100%.[266]

In general, although two different firms may be selling a CRT product with the same specifications, from the consumer's perspective they are typically not selling the identical product because firms do more than simply hand over merchandise to purchasers. For example, different retailers provide different levels of customer service, product information, return policies, installation support, pre- and post-purchase consultation, repairs, and store warranties. Different retailers may experience different rental expenses based on the desirability and convenience of their store locations. Some retailers do not advertise at all, while others provide consumers with information pertaining to products available, prices, performance, and store locations. Some retailers operate only online, in which case shipping costs become relevant to the consumer for both the purchase and potential return. The price of the products offered by a retailer in a competitive distribution market reflect all of the costs incurred by the retailer; in turn, the price of the product bundled together with other services, only some of which are described above, will vary among retailers.

The following example illustrates that pass-through is consistent with different prices across retailers. Suppose that retailer A runs a no-frills operation and has cost of $100 for a CRT monitor plus $5 per sale in processing costs; intense competition leads retailer A to charge $105. Retailer B runs a high-status, full-service operation, and has costs of $100 for the same CRT monitor, $10 per sale in processing costs, and $10 per sale in customer service; intense competition leads retailer B to charge $120. Thus, the same CRT monitor is available for $105 from retailer A and for $120 from retailer B. Now suppose that the cost for the CRT monitor increases to both retailers from $100 to $110 and other costs are unchanged. Retailer A will raise its price to $115 and retailer B will raise its price to $130. The price for the same CRT monitor is higher at retailer B, before and after the increase in the cost of the CRT, and both firms have 100% pass-through.

Prices may also vary across CRTs and CRT products, even at the same distribution firm. For example, graphics quality is superior on high definition TVs compared to standard definition

[265] The end consumer price for the CRT monitor increased from $115 to $130. Direct purchasers buy tubes which are used to make CRT products; the tube costs increased from $100 to $110.

[266] I discuss the effects of competition on the pass-through rate in Section VIII.B.1.a).

TVs. Based on the superior graphics, the market price for high definition TVs will be higher than for standard definition TVs that are otherwise identical.[267] Regardless of the fact that these products are differentiated and sold at different prices, pass-through still occurs. Further, because these products are sold in highly competitive distribution channels, the pass-through rate is expected to be close to 100%. There is nothing inconsistent between the pass-through of overcharges and product differentiation.

Consider a variation on the earlier numerical example. Suppose that no-frills retailer A sells a standard definition CRT TV model X and a high definition CRT TV model Y. Suppose A pays $300 for the standard definition CRT TV and $400 for the high definition CRT TV. Retailer A also bears other processing costs of $5 for either the standard definition or the high definition CRT TV. Due to intense competition, retailer A sets price to cover its total costs, and prices the standard definition TV model X at $305 and the high definition TV model Y at $405. Now suppose that the cost of CRT TV model X increases to $310 and the cost of CRT TV model Y increases to $417. Retailer A again sets price to cover its full costs, so prices X at $315 and Y at $422. In both cases, retailer A has fully passed on its cost increases. In one case cost increased by $10, as did price; in the other cost increased by $17, as did prices.

(5) Pass-through is consistent with loss-leader and other discount pricing

Firms sometimes engage in a variety of pricing techniques to attract customers, including offering discounts (sales) and rebates or using loss-leaders.[268] These pricing techniques are simply different forms of marketing expenditure: a reseller incurs a cost in the form of reduced sales revenue in order to entice consumers to purchase its other products. A firm that chooses to incur these marketing expenditures in the actual world would have the same incentive to incur these expenditures in the but-for world in which no price-fixing conspiracy existed. In the but-for world, the only difference would be that the firms' costs were lower absent the alleged overcharge.

The following example illustrates this point. Suppose retailer A has costs of $300 for a TV, and $5 in per sale processing costs. Assuming a competitive environment, it will sell the TV for $305. Suppose retailer A decides to incur a $10 marketing cost per sale in the form of a sale price, which results in the TV being sold for $295 (below its cost), with the expectation that A's total profits will increase based on consumers coming in for the low price TV purchasing additional products. Now consider a world in which the cost for the same TV to retailer A is $260 instead of $300. Assuming the retailer passes through 100% of its cost change and still incurs the same marketing cost, the resulting price is $255. In this example, the retailer is still spending $10 per unit on marketing (it has product and processing costs of $265, which are discounted by $10 as a marketing strategy). The retailer is making the same per-unit profit, which is negative $5 (the expectation is that the reseller will make up this loss on the sale of other more profitable sales, either during the same visit or sometime in the future). In this

[267] E.g., the average retail price in the U.S. in April 2006 for a Samsung TX-S2783 27" 4:3 CRT SlimFit TV was $349 and for a Samsung TX-S2782H 27" 4:3 CRT SlimFit HDTV $524. Witsview, April 2007, Monthly Major Region Street Price Book, LGE00082765.

[268] The term loss-leader refers to an item being sold at a discounted price, sometimes at or even below cost. The purpose of this pricing practice is to attract customers into the store and increase sales on other, more profitable items. Loss-leaders are essentially temporary sales promotions.

example, the retailer has passed-through 100% of the reduced TV price while continuing to use the TV as a loss-leader: the cost to the retailer was reduced by $40, the same amount by which the price to the consumer was reduced. In this manner, it is evident that incurring marketing costs in the form of discounts or sale prices is unrelated to whether input costs are being passed through, and 100% pass-through of the (savings from the) eliminated overcharge is completely feasible even if the firm is "selling at a loss".[269]

(6) Pass-through is consistent with focal point pricing

Focal point pricing is the tendency for firms to set prices at specific price points, which usually end in "9", such as $49. The use of this pricing strategy does not prevent the pass-through of overcharges. First, a reseller can pass through cost changes while still using focal point pricing. Second, quality adjustments can be made to offset cost changes, so that the original focal price can be kept. In either event, the overcharge is passed through to the buyer.

Suppose that a firm that uses focal point pricing faces a cost increase. The reseller can simply increase the price to a higher focal point. Suppose a TV OEM sells a CRT TV for $399, and that the cost of the tube increases from $60 to $70. The TV OEM could increase the price of the TV from $399 to $409 to compensate for the $10 cost increase. Alternately, an OEM could adjust the quality of a finished product in order to offset the CRT tube cost increase. Extending the previous example, the TV OEM could switch to a lower quality and less expensive tuner in order to offset the CRT tube cost increase. As such, the OEM maintains the same focal point price; however, the cost increase is still passed-through to the consumer since the consumer pays the same amount for an inferior product. As these examples show, there is nothing inconsistent between focal point pricing and the pass-through of overcharges.

(7) Summary: Pass-through is positive

Deviations from the conditions of a perfectly competitive market prevent firms from the complete and instantaneous adjustment of price to cost changes, but they do not prevent firms from passing through cost changes. None of these deviations individually determines the pass-through rate, and none of these factors are inconsistent with a positive pass-through rate or a pass-through rate of 100%.

In this matter, the cost increases imposed by Defendants were industry-wide,[270] they were not transient, [271] and they were significant.[272] Therefore I conclude that the overcharge was passed through to class members.

2. The pass-through rate is close to 100% or more than 100%

a) The more competitive the industry, the closer the pass-through rate is to 100%

[269] This is true for any pass-through rate.

[270] See Section VIII.A.2.a).

[271] The cost increases imposed by the cartel were not temporary. The cartel set prices that were expected to last for quarters, but sometimes months or half-years. See Target price-structure.xlsx in my back-up materials.

[272] See Section IX.

Suppose that an industry is imperfectly competitive; the pass-through rate could be above or below 100%. Regardless of whether it was initially above or below 100%, as the degree of competition in the industry increases, the pass-through rate approaches 100%. At the extreme, when the industry achieves perfect competition (and costs are constant), the pass-through rate reaches 100%. The more competitive an industry, the closer the pass-through rate is to 100%.[273]

b) The distribution channel is highly competitive and therefore the pass-through rate is likely close to 100%

As described above (see Section VI.E and Exhibit 10), there are multiple steps in the distribution of CRTs to class members. As each of these levels becomes more competitive, the pass-through rate at each level approaches 100% and, accordingly, the channel-length pass-through rate also approaches 100%. The documentary evidence, from a variety of sources, indicates that each of the distribution levels for CRT monitors and TVs is highly competitive.[274]

There are a large number of firms involved in the production and the distribution of CRT products, which is one indicator of intense competition. There are at least 28 brands of CRT monitors and at least 29 brands of CRT TVs.[275] Exhibits 55 and 56 present worldwide market shares for each of the monitor and TV brands.

Intense competition is also evidenced by the lack of concentration among the sellers of CRT products. As explained in Section VI.C.1, HHIs (Herfindahl-Hirschman Indices) are used to measure the degree of concentration. Lower HHI values indicate a less concentrated market and, hence, more competitive conditions for market participants. I calculate HHIs, reported in parentheses, for monitor brands (1121) and TV brands (971);[276] these HHIs fall into the "unconcentrated" category based on the DOJ guidelines.[277]

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[273] See, e.g.,

- Benigno, Pierpaolo and Ester Faia, March 2010, Globalization, Pass-Through and Inflation Dynamic, NBER Working Paper 15842, http://www.nber.org/papers/w15842, accessed 09 August 2012.
- Verboven, Frank and Theon vanDuk, September 2009, Cartel Damages Claims and the Passing-On Defense, The Journal of Industrial Economics, Vol. 57(3), 457-491.
- Werden, Gregory J., Luke M. Froeb, and Steven Tschantz, October 2005, The Effects of Merger Efficiencies on Consumers of Differentiated Products, European Competition Journal, Vol. 1(2), 245-264.

[274] That the CRT product manufacturing industry is highly competitive is not inconsistent with Plaintiffs' claims that they paid supra-competitive prices for CRT products. By fixing the price of CRTs, the Defendants in effect are fixing the price of products, because product prices are a function of CRT prices; an increase in the price of CRTs leads to an increase in the price of CRT products, as discussed in Section VIII.B.

[275] These numbers are a lower bound because the data contain an "other" category that includes multiple, smaller, brands.

[276] Market shares and HHIs are calculated using worldwide quantities sold of TVs for 2005-2006 and monitors for 2004-2006. See,

- DisplaySearch, 2007, Quarterly Desktop Monitor Shipment and Forecast Report, CHU00154421.
- DisplaySearch, 2007, DisplaySearch Q2'07 Quarterly Global TV Shipment and Forecast Report, SEAI-CRT-00223186.

[277] According to the 2010 Horizontal Merger Guidelines, the U.S. Department of Justice (DOJ) considers markets with HHIs below 1500 to be "unconcentrated", between 1500-2500 "moderately concentrated", and above 2500

Intense competition also leads to low profit rates, which is also a characteristic of the production and distribution of CRT products. The trade press, financial analysts, and industry participants recognized the intense competition and low profit rate; see Exhibit 53.

The trade press reports a high degree of competition in the production, distribution, and sales of CRT products. The firms that produce and distribute CRT products routinely report intense competition. CRT manufacturers also recognize intense competition throughout the entire distribution channel. See Exhibit 54.

c) Pass-through is always greater than 100% when firms use "cost-plus" pricing rules

I explained above that for imperfectly competitive markets, pass-through may be greater than or less than 100%. Under certain conditions, more is known about the magnitude of the pass-through rate. Specifically, if a firm uses cost-plus pricing, its pass-through rate is at least 100%. Cost-plus pricing is the practice of applying a certain markup to cost to set price; the mark-up could be expressed in percentage terms (price is equal to a given percentage above cost) or in dollar terms (price is equal to cost plus a specific dollar mark-up).[278]

In the case of cost-plus pricing in percentage terms, the pass-through rate is equal to the mark-up rate and is always greater than 100%. For example, suppose that a firm always marks costs up by 20%; if costs are $100, then the firm sets price at $120 (= $100 × 120% mark-up). When costs increase by $1, price will increase by $1.20 (= $1 × 120% mark-up), and thus the pass-through rate is equal to 120% (= change in price / change in cost = $1 / $1.20). Now consider a firm that uses cost-plus pricing in dollar terms. For example, suppose that a firm always sets price by adding $40 to its costs. If costs are $100, the firm sets a price of $140 (= $100 + $40 mark-up). If costs fall to $99, the firm decreases its price to $139. In the case of cost-plus pricing in dollar terms, the pass-through rate will always be equal to 100% (= change in cost / change in price = $1 / $1).

d) Firms use "cost-plus" pricing rules

There is evidence that cost-plus pricing policies were used in the distribution channel for CRT products.[279] To the extent that resellers follow these pricing policies, a reliable estimate of the pass-through rate is at least 100%.

"highly concentrated". Department of Justice and Federal Trade Commission, 18 August 2010, 2010 Horizontal Merger Guidelines, at Section 5.3 Market Concentration.

[278] For certain types of demand, using a cost-plus rule is the profit-maximizing pricing strategy. This is true if a firm faces a demand curve with constant elasticity of demand (that is, the elasticity of demand is the same at every price). In lay terms, this means that given a 1% increase in price—regardless of whether the starting price is at a high level, a middle level, or a low level—the quantity demanded will decline by the same percentage. Bulow, Jeremy I. and Paul Pfleiderer, February 1983, A Note on the Effect of Cost Changes on Prices, The Journal of Political Economy, Vol. 91(1), 182-185, at 183.

[279] See, e.g.,

- "Q. Would you sell your product above the FOB price? A. Yes. Q. Always? A. Sure. We needed – we required a markup. So we would buy it FOB, there would be a standard margin that Panasonic, PNA, would have to achieve." 18 July 2012, Deposition of Panasonic North America 30(b)(6) Witness Edwin Wolff (Hereinafter "Panasonic 30(b)(6) Deposition of Edwin Wolff, 18 July 2012"), at 26:13-27:5.

e) Summary: The pass-through rate is close to 100% or more

Because the resellers of the affected products operated in a highly competitive environment and some resellers utilized cost-plus pricing, I conclude that the pass-through rate is close to 100% or higher. In Section X, I describe the 62 pass-through studies I performed that confirm that pass-through is at least 100%.

3. Market participants recognized that CRT price changes are passed through

The documentary and testimonial evidence in this matter is consistent with the economic theory discussed above. Specifically, Defendants and other market participants explicitly and implicitly acknowledge that distributors, manufacturers, and resellers of CRT products pass-through cost changes to their customers throughout the entire distribution channel.

- Defendants indicate that pass-through of tube prices to product prices occurs. See Exhibit 57.
- Industry participants, including CRT product makers, market research firms, and the trade press, indicate that pass-through occurs. See Exhibit 58.

- Roger De Moor of Philips testified regarding Philips Consumer Electronics margins on sales of CRT monitors to Dell: "Q. Did PCEC typically have a set margin they were trying to achieve when working with Dell? A. We all had. Q. Did that margin vary over time or was there a particular set one within each organization that they aimed for? A. That was on the product level within the organizations." Philips 30(b)(6) Deposition of Roger De Moor, 31 July 2012, 31 July 2012, at 176:16-177:1.
- Kimura Mashiro of Panasonic testified regarding CRT product resellers' profit margins: "Q. So the dealer margin number would always be a positive number? A. Yes, correct." 19 July 2012, Deposition of Panasonic Corporation, Panasonic North America and MTPD 30(b)(6) Witness Mishiro Kimura (Hereinafter "Panasonic 30(b)(6) Deposition of Mishiro Kimura, 19 July 2012"), at 69:22-24.
- Roger De Moor of Philips testified: "Q. So on bigger retailers, was there a particular margin that each different retailer always or often tried to achieve? MR. EMANUELSON: Objection, vague. A. That's my understanding." Philips 30(b)(6) Deposition of Roger De Moor, 31 July 2012, at 302:3-7.
- Thomas Heiser of Hitachi USA testified regarding retailers' margins: "Again, you know, at the time in '96 it was our understanding that Circuit City and those guys, they typically were between 30 and 40 percent, 30 and 40 points max – margin, I mean, so... Q. Okay. And what do you mean by retail margins, just to make sure we're on the same page? A. So if they bought a set for 700 from Hitachi, they'd sell it for 999. They would mark it up 30 percent or 40 percent was their markup. Q. And that was your understanding of approximately for the large retailers? A. Yeah, at that time." Hitachi 30(b)(6) Deposition of Thomas Heiser, 03 July 2012, at 151:17-152:3.
- "That markup of nearly 50% of the total cost is a 'healthy profit margin' for Amazon, said Van Baker, a Gartner Inc. analyst, adding that most consumer products have markups of 20% to 25% of total cost. 'A markup of 50% of total cost is almost impossible to do in consumer electronics just because the market is so competitive'." Matt Hamblen, 22 April 2009, Material costs for Kindle 2 are about half its retail price, ComputerWorld, http://www.computerworld.com/s/article/9131974/Materials_costs_for_Kindle_2_are_about_half_its_retail_price_, accessed 14 September 2012, at 1.
- Prices between DDI, a subsidiary of MTPD, and Funai were set using cost-plus rules: "Funai was a joint venture. So they were able to look at all the costs: The costs for the materials, for the labor, all costs. So all of the cost information was openly shared, and so it was cost plus a set margin." Panasonic 30(b)(6) Deposition of Tatsuo Tobinaga,16 July 2012, at 139: 13-17.

- The tie between CRT prices and CRT product prices is also reflected by CRT makers following CRT product "street prices", which are the prices for CRT products paid by end-users; following street prices reveals that the Defendants recognize the tie between tubes and product prices. See Exhibit 59.
- Market research firms, which provide data that Defendants rely upon,[280] regularly publish street prices. See Exhibit 60.

Trial testimony in a case involving price fixing of LCD panels by many of the same Defendants and Best Buy indicated that pass-through occurs. See Exhibit 61.

All in all, there is ample documentary and testimonial evidence, from a variety of market participants, showing that CRT product prices ultimately reflect increases in CRT prices.

4. Summary: Class members were harmed by the cartel

Based on economic theory and documentary and testimonial evidence, I conclude that the price increase to direct purchasers was passed through. This conclusion is further supported by the 62 statistical pass-through studies I conducted, as described in Section X and summarized in Exhibits 62 and 63. Furthermore, I am aware of no empirical study that contradicts the

[280] See, e.g.,

- Samsung testified: "Q. You mentioned earlier, I think you said the Marketing Department utilizes and sometimes relies on DisplaySearch information; is that accurate? A. That's accurate." 16 July 2012, Deposition of Samsung Electronics America 30(b)(6) Witness Kim London (Hereinafter "Samsung 30(b)(6) Deposition of Kim London, 16 July 2012"), at 262:16-19.
- Philips testified about responsibilities of another Philips employee: "Q. Do you know what his responsibilities were? A. Collect information about market trends, working with DisplaySearch, and presenting to management the information on which they could base their plans." Philips 30(b)(6) Deposition of Roger De Moor, 31 July 2012, at 70:19 - 71:1.
- [redacted]
- Hitachi America testified: "Q. Do you know whether HAL used data sources such as Display Search? A. Yes." 23 August 2012, Deposition of Hitachi America, LTD. 30(b)(6) Witness William Allen Whalen (Hereinafter "Hitachi 30(b)(6) Deposition of William Allen Whalen, 23 August 2012"), at 110:24 - 111:1.
- [redacted]
- Panasonic testified: "Q. […] Did you monitor the finished product prices of CRT TVs […] during the 2004 to 2008 time frame. A. Yes. […] Q. BY MR. LAMBRINOS: What documents did you use to track these prices? Please answer the question. A. Since market research, the companies that publish the price trends and so forth, I used such information to track down prices." Panasonic 30(b)(6) Deposition of Hirokazu Nishiyama, Vol. I, 17 July 2012, at 39:18 - 40:9.
- Toshiba testified: "Q. And how would you go out and monitor television pricing? A. Actually there was a couple different ways you can do it. There's reports you can go buy. I think there was like Stanford, Stanford Research or Display Search ..." TAEC 30(b)(6) Deposition of Jay Alan Heinecke, 31 July 2012, at 119:19 - 120:2.

theoretical findings. That is, I am aware of no study published in a peer-reviewed journal that has found a pass-through rate of zero. Thus, all class members suffered common damage in the form of higher prices.

IX. 25.0% and 9.5% are reasonable measures of the direct overcharge imposed on CDTs and CPTs, respectively

In Section VIII I presented the evidence and analyses on which I formed my opinion that Defendants' and Co-conspirators' conduct resulted in class members paying more for CRT products than they would have absent the cartel. In this section I apply widely-accepted economic principles and methods in a manner consistent with practices in the field of economics to the evidence of the case to quantify the amount by which Defendants overcharged the Class for CRT products by cartelizing CRTs.

Plaintiffs are indirect purchasers. Consequently, overcharges imposed on the class can be decomposed into (1) a measure of overcharge harm imposed on direct purchasers of CRTs integrated into products purchased by members of the class ("at-issue CRTs") and (2) the portion of that direct overcharge passed through to class members. I now describe the reasoning and evidence that support my conclusion that the cartel imposed a 25.0% overcharge for CDTs and a 9.5% overcharge for CPTs.[281] I detail my pass-through analysis in Section X and provide measures of total damages in Section XI.

The overcharge damages are the difference between the dollar amount that direct purchasers spent on at-issue CRTs in the actual world in which Defendants engaged in the collusive conduct and the dollar amount they would have spent if the Defendants had not engaged in the anticompetitive conduct. Formulaically, the dollar value of overcharge damages imposed on direct purchasers by Defendants is measured as:

$$\$Expenditures\ with\ Cartel - \$Expenditures\ without\ Cartel.$$

Because the but-for world is by definition hypothetical, expenditures that direct purchasers would have made absent the cartel are not observable. Consequently, the overcharge cannot be directly observed.[282] Economists have developed a number of research methods to use observable information to estimate outcomes in the unobservable but-for world.[283] I apply one of

[281] As explained in Section IX.B, I estimate two overcharges for CDTs and for CPTs, one for the time period 1995Q2 through 2006Q4 and another for 2007.

[282] "One of the central challenges of an overcharge analysis is determining the counterfactual scenario that would have existed but for the alleged anticompetitive conduct. While actual prices generally are known, the but-for prices are not observable and thus must be estimated." American Bar Association, 2010, Proving Antitrust Damages: Legal and Economic Issues, Second Edition, ABA Publishing: Chicago, p. 198.

[283] See, e.g.,

- "Many empirical questions in economics and other social sciences depend on causal effects of programs or policies. In the last two decades, much research has been done on the econometric and statistical analysis of the effects of such programs or treatments…The object of interest is a comparison of the two outcomes for the same unit when exposed, and when not exposed, to the treatment. The problem is that we can at most observe one of these outcomes because the unit can be exposed to only one level of the treatment. Holland (1986) refers to this as the 'fundamental problem of causal inference.' In order to evaluate the effect of the treatment we therefore always need to compare distinct units receiving the different levels of the treatment. Such a comparison can involve different physical units, or the same physical unit at different time."

the most widely used of these methods, regression analysis, to the facts and data of the case to obtain a reasonable measure of the effect of the cartel on CRT expenditures.

A. I use widely-accepted economic principles and methods to quantify the direct overcharge

In the absence of observations of the CRT prices in the but-for world, one reasonable way to estimate the direct overcharge is to compare CRT prices in periods from the actual world in which no collusive behavior occurred to CRT prices during periods of collusion. CRT prices from different time periods may reflect changes in more than just whether firms compete or collude. For instance, if a significant input in the production of CRTs had a higher price in the time period when the cartel operated relative to its price in the time period when the cartel did not operate, the price of CRTs would be expected to higher during the cartel in part because of the cost increase and not solely because of the difference in competitive and collusive conduct. Since CRT prices can be affected by more than the decision by suppliers to collude or compete, an estimate of the impact of the cartel must control for changes in CRT prices due to changes in other relevant factors.

Economists often use regression analysis to isolate the impact of one variable on another from the impact of other variables,[284] and the courts commonly accept regression analysis.[285] I use

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Imbens, Guido W. and Jeffrey M. Wooldridge, 2009, Recent Developments in the Econometrics of Program Evaluation, Journal of Economic Literature, Vol. 47, No. 1, 5-86, at 5.

- "The problem of evaluating the effect of a binary treatment or program is a well studied problem with a long history in both econometrics and statistics. This is true both in the theoretical literature as well as in the more applied literature." Imbens, Guido W. and Jeffrey M. Wooldridge, 2009, Recent Developments in the Econometrics of Program Evaluation, Journal of Economic Literature, Vol. 47, No. 1, 5-86, at 5.

In the present case, cartelization is the "treatment" and the difference in price between the without- and with-cartel periods is the "effect." The "fundamental problem of causal inference" is that the but-for price never existed due to the cartel and therefore is not observable.

[284] See, e.g.,

- "One of the more useful aspects of the multiple regression model is its ability to identify the independent effects of a set of variables on a dependent variable." Greene, William H., 2012, Econometric Analysis, Seventh Edition, Prentice Hall: Upper Saddle River, at 14.
- "Regression models form the core of the discipline of econometrics." Davidson, Russell and James G. MacKinnon, 2004, Econometric Theory and Methods, Oxford University Press: New York, at 1.
- "[T]he classical linear regression model…is the workhorse of econometrics." Gujarati, Damodar, 2011, Econometrics by Example, Palgrave Macillan: New York, at xvi.

[285] See, e.g.,

- Rubinfeld, Daniel L., 2000, Reference Guide on Multiple Regression, in Federal Judicial Center, and National Research Council (Eds.), Reference Manual on Scientific Evidence, Third Edition, National Academies Press: Washington, D.C., 303-358.
- "Econometric and regression analyses are particularly useful in separating the impact of an alleged anticompetitive act on market outcomes (such as pricing) from the influence of other factors." American Bar Association, 2010, Proving Antitrust Damages: Legal and Economic Issues, Second Edition, ABA Publishing: Chicago, at 125.
- "Multiple regression and other econometric methods have been used frequently in cases brought by the competition authorities and in private litigation." Rubinfeld, Daniel L., 2008, Quantitative Methods, in

regression analysis to isolate the impact of the cartel on CRT prices from the impact of other factors that may have also contributed to any CRT price differences between the with- and without-cartel periods.

As a first step in the regression analysis, an understanding of which variables may affect CRT prices is developed. Widely-accepted economic theory holds that a combination of supply factors, demand factors, and competitive interactions between suppliers drive market prices.[286] Consequently, by using data on CRT prices, supply and demand factors, and the nature of competitive interactions between CRT producers, I can implement regression analysis to the case facts and data to analyze the impact of collusion on CRT prices separately from the changes in CRT prices due to changes in non-cartel related supply and demand factors.

1. Reduced-form price equations are widely used and accepted

A type of model of the price-formation process widely used in empirical economics is what is known as a reduced-form price equation model – "reduced-form" because the system of supply and demand factors that co-determine price can be reduced mathematically to a single equation that relates prices to supply factors, consumer demand, and the competitiveness of the market.[287] When measuring the price-effect of changing from an economic environment in which firms do not collude to one in which firms do collude, a cartel indicator variable that identifies whether

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Antitrust, in American Bar Association (Eds.), Competition Law and Policy, Section of Antitrust Law, Issue 1, ABA Publishing: Chicago, 723-742, at 723.

- "The legal requirements for regression analysis fall under the rules for testimony by experts…Regression analyses have met these requirements many times in litigation for a wide range of issues, including the estimation of antitrust damages." American Bar Association, 2010, Proving Antitrust Damages: Legal and Economic Issues, Second Edition, ABA Publishing: Chicago, at 128-129.

[286] See, e.g.,

- Firm strategy "requires an understanding of how the price or quantity equilibrium depends on cost and demand functions." Church, Jeffrey, and Roger Ware, 2000, Industrial Organization: A Strategic Approach, McGraw-Hill: New York, at 233.
- "Market outcomes are determined by three factors: the nature of demand, the nature of the production process, and the nature of competitive interaction among suppliers." Porter, Robert and J. Douglas Zona, 1994, Bidding, Big Rigging, and School Milk Prices: Ohio v. Trauth, in Kwoka, Jr., John E. and White, Lawrence J. (Eds.), 2004 The Antitrust Revolution: Economics, Competition, and Policy, Fourth Edition, Oxford University Press: New York, at 213.

[287] See, e.g.,

- "The most common statistical method employed in antitrust litigation involves the estimation of 'reduced-form' price equations. A typical reduced-form model might explain the variation in the price of a product as a function of a series of variables relating to cost, demand, and market structure." Rubinfeld, Daniel L., 2008, Quantitative Methods, in Antitrust, in American Bar Association (Eds.), Competition Law and Policy, Section of Antitrust Law, Issue 1, ABA Publishing: Chicago, 723-742, at 724.
- "A 'reduced form' model is a single equation that describes prices (the dependent variable) as a function of various exogenous factors thought to influence supply and demand (such as costs, prices of substitutes, etc.)." American Bar Association, 2010, Proving Antitrust Damages: Legal and Economic Issues, Second Edition, ABA Publishing: Chicago, at 201.
- McCrary, Justin, and Daniel L. Rubinfeld, 2014, Measuring Benchmark Damages in Antitrust Litigation, Journal of Econometric Methods, 3(1), 63-74.

the observed data are from a cartel or non-cartel period is also included in the model to isolate the effect of the cartel on prices from price changes due to other factors.[288]

The cartel-indicator reduced-form price equation approach provides a widely-accepted economic framework by which to identify the changes in CRT prices due to the presence of the cartel separately from changes in CRT prices due to non-cartel factors.

B. The facts and data of the case form the basis for the direct overcharge measure

Although generally-accepted economic principles and methods provide the analytic framework, Defendants' sales data combined with relevant CRT supply and demand data form the evidentiary basis for the direct overcharge measure.

As explained in Section IX, due to the unavailability of prices class members would have paid in a world absent cartelization, I analyze Defendants' CRT sales data from time periods not believed cartelized and time periods with evidence of collusion.

I select my cartel date based on relevant evidence from the case. In particular, as I discuss in Section VIII.A.3.a) case evidence indicates that information exchanges began as early as February 1995 and continued through at least late 2007.[289] Additionally, I take into account the fact that the Department of Justice (DOJ), Korean Fair Trade Commission, and Japanese Fair Trade Commission cartelization investigation into a number of LCD producers, including some defendants in this case, became public in the last quarter of 2006.[290] It is possible that members of the CRT cartel changed their behavior in response to learning of these investigations in an attempt to minimize costs in the event of an investigation in the CRT industry. For example, cartel members may have considered becoming amnesty applicants in the CRT cartel or may have been less likely to continue meeting. If the LCD investigation did influence the behavior of

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[288] The cartel-period indicator model is one variant of the general "economic determinants" method of quantifying cartel effects I described in my class certification report. Netz Class Cert Report, at 85.

[289] Documented instances of information exchanges in 2007 regarding CDTs include:

- Oh, Tae Gyun, 10 November 2007, E-mail, Subject: Record of visits to Company C, SDCRT-0139342.
- Choi, Hoon, 14 September 2007, E-mail, Subject: A report on the glass supply condition of Chunghwa, SDCRT-0104771 - SDCRT-0104772.

Documented instances of information exchanges in 2007 regarding CPTs include:

- Lee, Dae-Eui, 19 September 2007, Request for Survey on Customer Response to Price Increase, SDCRT-0080694 - SDCRT-0080696.
- Choi, Kee, 13 July 2007, E-mail, Subject: Information Sharing] Main contents at the LPD meeting - 7/12 (Thu), SDCRT-0170843.
- Sanogawaya, Masaki, 09 November 2007, E-mail, Subject: Meeting memo, MTPD-0543148 - MTPD-0543150.

[290] See, e.g.,

- 12 February 2014, Brief for the United States of America, United States of America v. Shiu Lung Leung (In the United States Court of Appeals for the Ninth Circuit).
- Gohring, Nancy, 11 December 2006, LG.Philips Subpoenaed in LCD Competition Probe, InfoWorld, http://www.infoworld.com/d/security-central/lgphilips-subpoenaed-in-lcd-competition-probe-354, accessed 08 April 2014.

CRT cartel members, I expect the impact of the cartel to be smaller subsequent to the announcement of the LCD cartel investigation; however, I do not impose such a restriction on the model. I bifurcate the cartel period (1995Q2-2007Q4) into two segments based on the LCD investigation becoming public. Specifically, the first segment includes 1995Q2 - 2006Q4 and the second includes 2007Q1-2007Q4.

The most complete set of data for this analysis would include expenditures by direct purchasers on all at-issue CRTs – sold during the cartel period – and the expenditures by direct purchasers for CRTs that had the same (economically relevant) product characteristics from periods free from cartelization. Since expenditures are the product of the price of a good and the number of units purchased, expenditures on Defendants' CRTs can be calculated from Defendants' sales data, which reveal transaction quantities and revenues.

Net prices and other sales data for Defendants' CRTs from January 1, 1991 forward were requested.[291] Data produced in response to these requests have been incomplete, with some Defendants failing to provide any data whatsoever.[292] Data that were produced vary by Defendant in terms of time periods covered and production facilities included.[293] See Exhibit 64 for a list of Defendant data files used in my analyses.

Because the produced sales data may contain rebates, returns, or corrections to erroneous entries, I aggregate the transaction-level sales data to the quarterly level.[294] Additionally, as described below, I incorporated data from third parties to control for changes in CRT prices due to non-cartel factors, and these data are reported at the quarterly level. Therefore, aggregating the price

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[291] See, e.g.,

- 10 June 2008, Indirect Purchaser Plaintiffs' First Request for Production of Documents from Defendants, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).
- 25 March 2010, Indirect Purchaser Plaintiffs' Second Request for Production of Documents from Defendants, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).
- 04 June 2008, Direct Purchaser Plaintiffs' First Set of Requests for Production of Documents, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).
- 12 March 2010, Direct Purchaser Plaintiffs' Second Set of Requests for Production of Documents, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

[292] Defendants Thomson/Videocon, Orion/Daewoo, IRICO, Samtel, and Thai-CRT did not produce CRT tubes sales data.

[293] For example, LPD only provided data from its Ottawa, Ohio plant.

[294] For example, on May 21, 1996 Philips recorded three invoices for customer order 300722, each with 416 units priced at $189.49. On June 11, 1996, Philips recorded three invoices containing the note "300722 WRONG PRICE" that reversed the May 21 sales. Another three invoices from June 11, 1996 re-invoice the original sales at a price of $187.46. When collapsing by quarter, these observations show up as a single observation with the corrected price of $187.46.

This method of aggregating does not completely resolve the problem of adjustments in the data, as an adjustment may occur during a different quarter than the original transaction, but it does mitigate the problem.

data to the quarterly level allows all variables in the price equation to be measured at the same time frequency.

Subsequent to filtering and cleaning, the produced CRT sales data deemed usable for the overcharge analysis include quarterly price observations beginning in 1993Q1 and continuing through 2010Q4.

- There are 49 CDT price observations from Chunghwa, LGE, Panasonic, Philips, and Toshiba prior to 1995Q2; for CPTs there are 145 observations from Chunghwa, Hitachi, LGE, Panasonic, Philips, and Toshiba.
- Between 1995Q2 and 2006Q4 there are 1,011 CDT price observations from Chunghwa, Daewoo, Hitachi, LGE, LPD, Mitsubishi, Panasonic, Philips, Samsung, and Toshiba; for CPTs there are 2,155 observations from the same manufacturers plus Irico, Samtel, and Thai CRT.
- In 2007, there are 38 CDT price observations from Chunghwa, LPD, and Samsung; for CPTs there are 168 observations in 2007 from Chunghwa, Daewoo, Irico, LPD, Panasonic, Samsung, and Samtel.
- There are 16 CDT price observations from Chunghwa and LPD after 2007; for CPTs there are 106 observations from Chunghwa, Daewoo, Irico, LPD, and Samtel.

Although, as is generally the case in empirical research, the set of data available for the analysis does not cover the entire population of interest, I consider the available data sufficiently complete to provide a reasonable measure of the cartel overcharges.[295] I base my opinion on the comprehensive sales data requests made of the Defendants, the lack of evidence that Defendants systematically withheld data, the availability of useable data from before and after the cartel period, and the ability of the dummy variable approach to provide reliable estimates in situations with relatively limited data.[296]

[295] See, e.g.,

- "Multiple regression uses a sample, or a selection of data, from the population (all the units of interest) to obtain estimates of the values of the parameters of the model." Rubinfeld, Daniel L., 2011, Reference Guide on Multiple Regression, Reference Manual on Scientific Evidence, Third Edition, National Academies Press: Washington, D.C., 303-357, at 312.
- "Samples presented in the courtroom have ranged from 5 (tiny) to 1.7 million (huge)." Kaye, David H. and David A. Freeman, 2011, Reference Guide on Statistics, Reference Manual on Scientific Evidence, Third Edition, National Academies Press: Washington, D.C., 211-302, at 247.

[296] Making judgments about the usefulness of a particular set of data is part of the job of a researcher. Moreover, one strength of the dummy variable approach is its usefulness when data is relatively limited. See, e.g.,

- "The validity of data is ultimately a matter of judgment." Allen Mark A., Hall, Robert E, et al., 2011, Reference Guide on Estimation of Economic Damages, Reference Manual on Scientific Evidence, Third Edition, National Academies Press: Washington, D.C., 425-502.
- "The dummy variable approach is appealing because it can be applied even where there is a relative paucity of data in the nonconspiratorial period." Rubinfeld, Daniel L., 2008, Quantitative Methods in Antitrust, Competition Law and Policy, Issue 1, ABA Section of Antitrust Law, 723-742, at 740.

In addition to Defendants sales data, I collected data related to CRT manufacturing costs, the availability of potential substitutes, and indicators of world-wide demand to control for the influence of CRT supply and demand factors on CRT prices.

Manufacturing costs are a key supply factor relevant to a product's price. Cost data beginning January 1991 have been requested from Defendants.[297] However, insufficient defendant-specific cost data that could be directly included in the regression analysis have been produced at this point. In particular, defendant cost data either do not cover the required time period, aggregate over multiple cost categories without indicating how to disaggregate, or simply have not been produced.[298]

A number of organizations collect and publish cost data that are relevant in the present case. Economists often use such information in research. The costs of the glass funnels and panels comprise a significant portion of the materials cost.[299] I included CPT glass price data from the

[297] See, e.g.,

- 25 March 2010, Indirect Purchaser Plaintiffs' Second Request for Production of Documents from Defendants, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).
- 12 March 2010, Direct Purchaser Plaintiffs' Second Set of Requests for Production of Documents, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

[298] See, e.g.,

- "The LGE defendants do not have transactional cost data in a centralized, electronic database." Shapland, Eric, 30 March 2012, Letter from Eric Shapland to R. Alexander Saveri and Lauren C. Russell, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).
- "We replied on October 31, 2011 that the Panasonic Defendants had been unable to identify cost data pertaining to CRTs or CRT finished products in a consolidated, readily accessible format." Hemlock, Adam C., 04 May 2012, Letter from Adam C Hemlock to Michael Christian, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).
- "…data regarding costs and transactions prior to 1998 is not available." Scarborough, Michael, 08 March 2012, Letter from Michael Scarborough to R. Alexander Saveri and Lauren C. Russell, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

[299] See, e.g.,

- "A. Of the total cost, the material cost was around 70 percent, and of that 70 percent was for glass, the cost for Panel and funnels. So I think I can say that approximately half the cost was for glass." Panasonic 30(b)(6) Deposition of Tatsuo Tobinaga,16 July 2012, at 84:5 - 8.
- "CRT glass typically accounts for about 40% of the overall production cost of CPT and about 22% of that of CDT." ABN AMRO Bank, N.V., Citibank/Salomon Smith Barney Hong Kong Limited, et al., May 2001, LG.Philips Displays Holding B.V. US$2,000,000,000 Senior Term Loan and Revolving Credit Facility, PHLP-CRT-051982 - PHLP-CRT-052085, at 2035.
- "With a trend toward larger picture tubes, glass represents a growing percentage of the value of materials, currently around 60 percent, up from 30 percent just a few years ago." United States International Trade Commission, May 1995, Industry & Trade Summary: Television Picture Tubes and Other Cathode-Ray Tubes, USITC Publication 2877, p. 4, http://www.usitc.gov/publications/701_731/pub3695.pdf, accessed 17 May 2012.

Bank of Korea in the regression analysis to account for variation in CRT prices due to changes in production costs.[300]

Changes in demand conditions may also result in changes in product prices. In particular, income and the availability of functional substitutes are key drivers of consumer demand. Because CRT products are sold worldwide, I included data on gross domestic product and unemployment from the Organisation for Economic Co-operation and Development (OECD), a source commonly used by economists and that includes more countries than other similar data sets, to account for changes in CRT prices due to changes in demand conditions flowing from changes in income.[301, 302]

The availability of functional substitutes also influences the level of consumer demand for a product. In the present case, other display technologies such as LCD monitors and TVs provided functional substitutes for end-users. Data on worldwide LCD TV and monitor revenues as a share of total TV and monitor revenues are included in the regression to account for changes in the level of demand for CRTs.[303]

To account for the effect of additional factors that influenced the trend in CRT prices over the long term, I included a second order time trend. This trend is composed of a linear and a quadratic component. The linear component takes a value of one in 1993q1 and increases by one in each subsequent quarter. The quadratic component equals the square of the linear component. In addition to capturing the overall trend in CRT prices, these variables address the "spurious regression problem" that can occur with data that vary over time. If both the dependent variable and an independent variable are growing over time, then a regression might find a statistical relationship between the two even if a different economic relationship exists. Adding a time trend to the model eliminates this problem[304] and allows for a more accurate estimate of the overcharge.

Formulaically, I estimated the following reduced-form price equation to quantify the CRT cartel effect:

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[300] The Bank of Korea, Undated, Producer Price Indexes Bank of Korea, http://ecos.bok.or.kr/flex/EasySearch_e.jsp, accessed 10 October 2013.

[301] The current members of the OECD are Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, and United States. Organisation for Economic Co-operation and Development, 17 February 2014, Members and Partners - OECD, http://www.oecd.org/about/membersandpartners/, accessed 17 February 2014.

[302] I also considered using a measure of global output produced by the World Bank to account for changes in demand in countries that are not members of the OECD, including China and India. However, these data only extend through the beginning of 1994.

[303] Although LCD TVs and monitors provided similar functionality as CRT TVs and monitors, they do not appear to have been economic substitutes, in the sense of CRT manufacturers being able to attract LCD customers by altering CRT prices, for much of the time period of interest in the present case. For more details see the discussion in Section VIII.A.2.c).

[304] "The phenomenon of finding a relationship between two or more trending variables simply because each is growing over time is an example of a spurious regression problem. Fortunately, adding a time trend eliminates this problem." Wooldridge, Jeffrey M., 2000, Introductory Econometrics: A Modern Approach, South-Western College Publishing: Mason, at 334 - 335.

$$\ln Price_{it} = \alpha + \theta_1 Cartel1995\text{-}2006_t + \theta_2 Cartel2007_t$$
$$+ \beta_1 \ln Glass_t + \beta_2 (\ln Glass_t \times Size_{it}) + \beta_3 (\ln Glass_t \times Size_{it}^2)$$
$$+ \beta_4 \ln GDP_t + \beta_5 U_t + \beta 6\, U_t^2 + \beta_7 \ln LCD_t + \beta_8 \ln LCD_t^2$$
$$+ \gamma_1 Time_t + \gamma_2 Time_t^2 + \delta Quarter_t + \eta Maker_{it} + \rho (Maker_{it} \times Size_{it}) + \varepsilon_{it}$$

where:

- $Price_{it}$ measures the price charged for CRT model-manufacturer pair i at time t;
- the indicator variable $Cartel1995\text{-}2006_t$ equals one from 1995Q2 until 2006Q4 and zero otherwise; $Cartel2007_t$ equals one from 2007Q1 until 2007Q4 and zero otherwise;
- $Glass_t$ measures the price of CRT glass at time t; $\ln Glass_t \times Size_{it}$ allows for the possibility that changes in glass prices affect CRT prices differently for different sized CRTs and $(\ln Glass_t \times Size_{it}^2)$ allows for a non-linear impact of a change in glass prices on CRT prices;
- GDP_t and U_t are the OECD output and unemployment rate at time t and the inclusion of U_t^2 allows for changes in unemployment to affect CRT prices differently at different levels of unemployment;
- LCD_t measures the revenue from the sale of LCD finished TVs or monitors as a share of total revenues from the sale of finished TVs or monitors and the inclusion of LCD_t^2 allows for changes in revenue share of LCDs to affect CRT prices differently depending on how prevalent LCDs are in the market;
- $Time_t$ and $Time_t^2$ are the time variables allowing for a trending influence on price; the $Quarter_t$ variables equal one in the relevant calendar quarter of the year and allow for the possibility of seasonal trends in CRT prices;
- the indicator variable $Maker_{it}$ identifies the manufacturer for the model-manufacturer pair i at time t and $Maker_{it} \times Size_{it}$ allows for the possibility that price differences between CRTs may vary based on the maker and size.[305]

Some case evidence suggests that prices of CDTs and CPTs did not respond to changes in market conditions in the same manner;[306] therefore, I estimated separate CDT and CPT regressions. I

[305] The coefficients on the supply and demand variables in a reduced-form price equation are not necessarily directly interpretable as they combine effects from both the supply side and demand side of the market into a single coefficient. See, e.g.,

- "When interpreting reduced-form regression coefficients…one needs to remember that these parameters are a function of those from the underlying structural model…Therefore, while the expected sign of a reduced-form regression is informed by economic theory, it also is dependent on the underlying structural regression coefficients (some of which may have opposing effects on equilibrium price)." Nieberding, James F., November 2006, Estimating Overcharges in Antitrust Cases Using a Reduced-Form Approach: Methods and Issues, Journal of Applied Economics, Vol. 9(2), 361-380, at 365-366.
- A reduced-form price equation "is not typically interpreted as an inverse demand equation, but rather a reduced form model for price. Consequently, there may be no economic basis for the assumption that the quantity and unexplained price deviations are negatively related." McCrary, Justin, and Daniel L. Rubinfeld, 2014, Measuring Benchmark Dames in Antitrust Litigation, Journal of Econometric Methods, 3(1), 63-74, at 66.

also limited the CDT after-cartel period to an end-date of 2008Q4 since there is evidence that by the end of 2008 Chunghwa was the primary CDT manufacturer.[307,308]

The regressions result in estimates of overcharges to direct buyers of CDTs of 25.0% prior to the LCD cartel investigation becoming public and 12.3% after and an overcharge of 9.5% to direct purchasers of CPTs prior to the LCD cartel investigation becoming public and 3.2% after.

These overcharge rates are consistent with economic theory applied to the case evidence that Defendants organized and participated in a long-standing cartel despite the substantial costs and risks of doing so.[309] As expected, the pre-LCD investigation overcharges are higher than the post-investigation overcharges, and the two are statistically significantly different.[310] Moreover, these results are within the typical cartel overcharges range estimated in scholarly empirical research on the topic.[311]

In addition to fitting with economic theory and being consistent with other studies of cartel overcharges, my model provides a good statistical fit to the data and the results are statistically significant. See Exhibit 65 for the regression results.

As additional sensitivity checks I consider what happens when:

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[306] See, e.g., "And glass bulb price was increased from 2Q. 2. So, we believe that price can be increased from 3Q. 3. But, TV & DSP [display or monitor] market are quite different, the action must be taken very carefully. So we would like to suggest Guideline of price and timing expected be decided on the meeting of Apr. 15. Finally, CPT maker need to have a meeting to discuss detailed action plan to increase the price from 3Q in the beginning of May." Chunghwa Picture Tubes, LTD, 09 April 1999, Visitation Report, Subject: 14", 20", 21" CPT Respective Makers' Recent Status and Price Opinion Review, CHU00028606 - CHU00028608, at 8608.01E.

[307] Although Samsung's produced CDT sales data ends after 2007Q4 and LPD's after 2008Q2, there is evidence that both companies continued selling CDTs through late 2008. See, e.g.,

- Samsung 30(b)(6) deposition testimony that the company produced and sold CDTs through 2008. Samsung SDI 30(b)(6) Deposition of Jaein Lee, Vol. II, 07 June 2012, p. 176.
- Actual sales through September 2008 are reported in A.A.M. Deterink, 20 November 2008, Trustee's Sixth Report in the bankruptcy of LG.Philips Displays Holding B.V. and LG.Philips Displays Netherlands B.V. and LG.Philips Displays Investment B.V., p. 11, http://deterinklive.com/nl/publicaties/faillissementsverslagen/l/, accessed 12 July 2012.

[308] As I discuss below, my overcharge estimate is robust to extending the CDT after-cartel period to 2010Q4, the same period I use for CPTs.

[309] "[T]he underlying economic theory provides a vital check" of a regression model. Pindyck, Robert S. and Daniel L. Rubinfeld, 2005, Microeconomics: Sixth Edition, Prentice Hall: Upper Saddle River, at 679.

In the present case, economic theory predicts that "Only if a cartel is expected to raise the price above the noncartel price and keep it high do firms join. [Accompanying footnote:] If the noncartel price is close to the cartel price, then firms may not believe that joining the cartel is profitable given the legal liability they potentially face from belonging to the cartel." Carlton, Dennis W. and Jeffrey M. Perloff, 2005, Modern Industrial Organization, Fourth Edition, Person Addison Wesley, at 131.

[310] I used an F-test to test the hypothesis that the coefficients for the first and second direct overcharge coefficients were equal. For both CPTs and CDTs, this hypothesis was rejected with a p-value of 0.00.

[311] Connor and Landes (2012) find that the median overcharge in scholarly studies of 1,517 estimates of cartel overcharges is 23.3% over all time periods and cartels and is higher, at 30.0%, for international cartels. Connor, John M. and Robert H. Lande, 2012, Cartels as Rational Business Strategy: Crime Pays, Cardozo Law Review Vol. 34, 427-490, p. 456. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1917657, accessed 02 April 2014.

- I include CDT sales occurring after 2008;
- I remove the squared demand terms (unemployment and LCD revenue share);
- I use lagged glass costs and demand variables instead of contemporaneous glass costs and demand variables;
- I end the cartel period at the announcement of the LCD investigation; and
- I maintain the cartel period from the Complaint but force the overcharge rate to be the same throughout the period.

For each sensitivity analysis the overcharge remains positive and significant for both CDTs and CPTs. The results of my sensitivity analyses are included in Exhibit 65.

C. Reliable application of widely-accepted economic principles and methods to the facts and data of the case yields a 25.0% overcharge for CDTs and a 9.5% direct overcharge for CPTs

Absent the availability of observations on but-for world CRT prices, I used regression analysis based on generally-accepted economic principles and methods applied to Defendants' CRT sales data, data on CRT supply and demand factors, and Defendant conduct to obtain a measure of the overcharge rate imposed on direct purchasers. The application of economically valid principles and methods in a manner consistent with practices in the field of economics to the case facts and data indicates that the cartel resulted in CDT overcharges of 25.0% for 1995Q2 to 2006Q4 and 12.3% for 2007Q1 to 2007Q4 and overcharges of 9.5% and 3.2% on CPTs.

X. Calculating the pass-through rate

In Section VIII.B I established that at least some portion of the overcharge to direct purchasers was passed through to class members, which is sufficient to establish that the cartel injured class members. In order to calculate damages to class members, I estimated of the extent to which the overcharge was passed through to class members (that is, I measured the extent to which changes in the price of CRTs translate into changes in the price for CRT monitors and TVs). Below I describe evidence (data) and a method to estimate the pass-through rate.

A. Data used to estimate pass-through

The data used for the econometric studies of pass-through included the prices at which CRTs and CRT products were bought and sold throughout the distribution channel. Ideally one would be able to isolate the change in price resulting from the cartel's behavior. This would require that prices rise on the first day of the cartel to the cartel level and fall on the last day of the cartel to the but-for level, while all else is held constant. These conditions, however, do not hold. I therefore based my estimate of the pass-through rate on observations on how firms set price based on cost; these data provided a reasonable proxy for how retail prices to class members would change in the face of cartel overcharges.

The data I used to measure pass-through contained a variety of ordinary cost and price levels and cost and price changes faced by CRT resellers. For each data set, I used all the usable data. Because these data are for all sales from a given reseller for a particular point in time, the data are likely to include cost changes that apply to all resellers and some that do not, cost changes both large and small, and cost changes both temporary and non-transitory. As I described in

Section VIII.B.1.b), cost changes are more likely to be passed through the more of the industry that faces the cost change, the larger the cost change, and the longer the cost change is expected to last. The data I employ for my studies provide a conservative estimate of the pass-through rate. That is, small, temporary, and firm-specific cost changes are less likely to be passed-through; therefore, including these observations in the pass-through studies will yield conservative estimates of the pass-through coefficient. Even though these data contain all types of cost changes, they can still be used as a basis for an economically meaningful measure of the pass-through rate.

To obtain an economically reasonable estimate of the pass-through rate, it is neither feasible nor necessary to measure pass-through for every individual firm in the distribution channel. There are many firms that participate in the production and distribution of CRT products, and not all of them maintain the data necessary to measure pass-through. Many resellers are located outside the U.S. and I understand are not obligated to respond to Plaintiffs' subpoenas requesting data. Some resellers no longer exist, nor do data on their past sales. One can calculate pass-through on an economically sound basis by obtaining data from a sample of the firms in the distribution channel, which is the approach that I used. At my direction and that of my staff, Plaintiffs' counsel has subpoenaed a range of different types of firms (e.g., "big box" stores, online retailers) operating at all levels of the distribution channel (e.g., product manufacturers, retailers), selling all types of at-issue CRT monitors and TVs. Using these third-party data produced in response to Plaintiffs' subpoenas, as well as other data produced by Defendants or plaintiffs in other, related cases, I have completed a considerable number of pass-through studies using data that represent the pricing decisions made by the various types of CRT resellers operating throughout the distribution channel. I understand that discovery does not close until September 5, 2014,[312] and I reserve the right to supplement my analysis as new data becomes available.

In order to use regression analysis, the data must include variations in price and in cost.[313] There are two types of data variation I can use: variations over time and variations over the cross-sectional unit; one can estimate pass-through using data containing either, or both, type of variation.

Data containing variations over time allow me to observe the sale of a specific CRT at different points in time. Data containing cross-sectional variation allow me to observe, for example, monitors containing different CRTs sold by the same retailer at a given point in time. If there is variation in the cost of the CRT, either over time for the same product or over different products, I could estimate the pass-through rate. Because both of these types of data can provide the necessary information to estimate pass-through, ignoring either type results in a pass-through estimate that is not based on all the available evidence in this matter.

Time series data control for differences in the cross-sectional unit. That is, in looking at the same product sold at the same outlet over time, I do not have to contend with differences in products

[312] 03 January 2014, Stipulation and Order Regarding Scheduling, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division), at 2

[313] In other words, knowing only that a product sells for $100 and costs $50 is not informative of the pass-through rate, even if one observes that same combination of cost and price over time, suppliers, and/or buyers. These hypothetical data simply show that the price of the product is twice as large as the cost; there is no variation in cost or price from which one could draw meaningful conclusions regarding the impact of cost changes on price.

and/or outlets that may also impact price. However, when observing changes in prices and costs over time, not only is the cost changing, but other factors are changing too, such as the quality of the product relative to other available products.[314]

In contrast, cross-sectional data control for changes over time, such as the relative quality of the product, which may impact price. However, when observing multiple products or a product sold at multiple outlets at a single point in time, there may be differences across products and/or across outlets that may have an impact on price as well as on cost. For example, the same TV model will be more expensive at a local electronics store with knowledgeable salespeople and extensive displays than the same TV at Costco, which has minimal sales assistance and minimal displays.[315]

As a third alternative, economists often use what is referred to as panel data, which contain variation across time and across a cross-sectional unit.

Typically an economist will use whatever data are available, specifying the regression to the specific characteristics of the data available. For example, if one uses cross-sectional units, one can include variables to control for differences in cross-sectional units, and if one uses time-series data, one can include variables to control for changes that take place over time.

When estimating the pass-through rate, one should make use of all the available types of evidence and all of these types of data provide insight regarding how firms will pass-through cost changes. In my studies, I followed this strategy. That is, I used whatever data were available, whether they have cross-sectional variation, time-series variation, or both, and control for other effects as appropriate.

B. Econometric design

1. The basic pass-through regression

The pass-through rate can be estimated by regressing the price of the CRT product on the cost of the CRT.[316] Mathematically, the regression equation for these studies can be represented by

[314] See, e.g.,

- [redacted]
- Another spreadsheet tracking the average street prices for CRT TV categories shows that only regular, round, standard definition CRT TVs were available in 1998. Beginning in 1999 and 2000, flat screen CRT TVs were introduced, and in 2002 wide screen, flat screen, high-definition ready TVs were being produced. Matsushita Display Devices (America), Undated, Price Spreadsheet, MTPD-0086013.

[315] For example, in July 2005, Costco sold Philips 27PT543S televisions for $180, while Best Buy sold the same model for $220. Chunghwa Picture Tubes and LTD, 20 September 2005, TV Price Summary, CHU00303245.

[316] The approach of regressing price on cost to estimate the pass-through rate is commonly used in the academic literature. See, e.g.,

- Doyle, Maura P., July 1997, The Effects of Interest Rates and Taxes on New Car Prices, Board of Governors of the Federal Reserve System Finance and Economics Discussion Series 1997-38.

$$\text{price} = \alpha + \beta \text{ cost} + \varepsilon \quad \text{or} \quad p = \alpha + \beta\, c + \varepsilon,$$

where p is the price of the CRT product, c is the cost of the CRT, and ε represents the error term. In this equation, the pass-through rate, which is equal to the derivative $\partial p/\partial c$, is equal to β; that is, the coefficient on the cost variable gives the pass-through rate.

The regression can be used to estimate the pass-through rate for the entire distribution channel or a portion of it. In either case, the price paid by the downstream purchaser (which could be a product manufacturer, a distributor, a reseller, or an end customer) for whatever item the downstream purchaser buys (it could be a CRT or it could be a product containing a CRT) is regressed on the upstream cost of either the CRT or the CRT product. In each case, the coefficient (β in the equation above) on the upstream cost variable gives the pass-through rate.

In the regressions as applied to the CRT industry, the cost variable that is used generally captures the majority of the cost of the item that is being sold. For example, when a firm is a product distributor or a retailer, the cost included in the regression is the entire cost of the CRT product, be it a monitor or TV. When a firm is a product manufacturer, the cost included is the cost of the CRT,[317] which is a substantial portion of the cost of both TV and monitors.[318]

- Stennek, Johan and Frank Verboven, 03 May 2001, Merger Control and Enterprise Competitiveness - Empirical Analysis and Policy Recommendations, Research Institute of Industrial Economics Working Paper No. 556.
- See also footnote 334.

[317] The cost data provided by some product manufactures included the cost for the complete finished CRT product. This is likely due to the fact that some product manufactures outsource the manufacturing of some products.

[318] See, e.g.,

- CRT TVs:
  - The CRT accounts for approximately 50% of the total value of the components in a finished television. U.S. International Trade Commission, May 1995, Industry Trade Summary: Television Picture Tubes and Other Cathode-Ray Tubes, USITC Publication 2877, http://www.usitc.gov/publications/docs/pubs/industry_trade_summaries/PUB2877/PUB2877.PDF, accessed 15 March 2012, at 1.
  - [redacted]
  - Toshiba testified that CRTs account for approximately 60%-65% of the total value of the components in a finished CRT TV. 01 August 2012, Deposition of Toshiba Corporation and Toshiba America Consumer Products 30(b)(6) Witness Yoshiaki Uchiyama (Hereinafter "Toshiba 30(b)(6) Deposition of Yoshiaki Uchiyama, 01 August 2012"), at 38:10-17 and 39:9.
  - DisplaySearch data covering 2006Q1 through 2008Q1show that the CRT accounts for approximately 52% of the total value of the components in finished 21-22" CRT TVs; 66% of 25-29" TVs; and 70% of 30-34" TVs. DisplaySearch, April 2008, Quarterly CRT TV Cost & Price Forecast Model Report, Q1'08 History with Q2'08-Q4'12 Forecasts, SDCRT-0002416.
- CRT Monitors:
  - Hitachi testified that CRTs account for approximately 45% to 55% of the total value of the components in a finished monitor. 12 July 2012, Deposition of Hitachi, Ltd. 30(b)(6) Witness

2. Other determinants of price

Price and cost are the necessary variables for the calculation of the pass-through rate, but it is likely that product characteristics (e.g., screen size) have an impact on the price level. I included variables to control for different product characteristics to the extent possible given the data. The variety and detail of each dataset determine which characteristics can be reliably controlled for in each study. I estimated separate regressions for each application and, whenever possible, controlled for the following product attributes: screen size, CRT manufacturer, resolution, high definition, and flat screen.[319] These product attributes were selected based on industry documents, which commonly classified products using these criteria.[320]

Including additional regressors in the analyses does not affect the interpretation of the coefficient on the cost variable as the pass-through rate; rather, the inclusion of these additional regressors is a variation on the same method of regressing downstream price on upstream cost. The purpose of adding additional regressors is to account for the unique characteristics inherent in each dataset. As stated above, I controlled for the same product attributes whenever the data allowed; however, not all datasets contained identical information on CRTs or CRT products.[321]

3. Is the entire overcharge passed through?

Because the distribution channel is highly competitive, I expect to find that pass-through is close to 100%, for the reasons described in Section VIII.B.2. Therefore I tested whether, in each econometric study, the estimated pass-through rate is statistically significantly different than

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Yasu Hisa Takeda, Volume I (Hereinafter "Hitachi 30(b)(6) Deposition of Yasu Hisa Takeda, Vol. I, 12 July 2012"), at 11:21-12:2.

- [redacted]

[319] Not all datasets provide sufficient detail to control for these attributes. Some datasets provide additional information, allowing me to control for additional attributes including, but not limited to, the presence of the following: VCR or DVD TV combinations, wide screen, HD-ready, picture-in-picture, and re-manufactured/refurbished products.

[320] Although there are other product characteristics, application, size, resolution, and manufacturer are the characteristics commonly used to differentiate CRTs.

- A DisplaySearch spreadsheet lists CRT televisions and their characteristics, including size, manufacturer, resolution/high definition, aspect ratio, and CRT technology (including whether it is a flat screen CRT). Chunghwa Picture Tubes, LTD, 20 September 2005, TV Price Summary, CHU00303245.
- In the cartel meeting notes, Defendants routinely refer to application, size, finish, and manufacturer when discussing CRTs. See Exhibit 1.

[321] For example, some of the datasets I employed are for CRT TVs and contain information on whether the product contained a built-in VCR or DVD player, whereas other datasets contain only sales for CRT monitors. With TVs, it makes sense to control for VCR/DVD combo; with monitors, it does not.

100%.[322] For those studies with results that are statistically significantly different from 100%, I then tested whether or not they were statistically significantly less than or greater than 100%.[323]

As I explained in Section VIII.B.2.a) when distribution firms operate in a perfectly competitive industry with constant costs, the theoretical pass-through rate is 100%. Because the distribution firms operate in a highly, but not perfectly, competitive industry, the pass-through rate calculated from the data may be greater than or less than 100%.

C. Summary of econometric estimates of pass-through

I conducted 62 empirical pass-through studies to calculate pass-through rates by application; that is, I calculated separate pass-through rates for monitor tubes (CDTs), TV tubes (CPTs), monitors, and TVs. I used data produced by Defendants as well as resellers of CRTs or CRT products and market research firms. Some of the data were actual transaction-level data or based on transaction-level data, meaning they represented the actual amount paid by the purchaser, while some of these data were price lists or price guidelines from which actual transaction prices were derived.

1. Wal-Mart

To illustrate the method used to calculate the pass-through rate and to demonstrate the usefulness of different types of data, I describe in detail three pass-through studies using different data sources for sales of CRT products at Wal-Mart. The datasets I used each contain purchases and sales of CRT products by Wal-Mart: two of the datasets were produced by Wal-Mart[324] and one was produced by Sanyo, one of Wal-Mart's suppliers. These files include different cost and price variables, all of which provide useful information pertaining to Wal-Mart's pricing practices and for measuring Wal-Mart's pass-through rate. These studies show that various types of price and cost data can be combined to measure pass-through.[325]

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[322] To test whether or not the pass-through rate is statistically significantly different from 100%, I used a Wald test and a significance level of 10%. Wooldridge, Jeffrey M., 2000, Introductory Econometrics, South-Western College Publishing, at 116-133.

[323] Before testing whether the estimated pass-through rate is equal to or different from 100%, I determined whether the data are homoskedastic (which means the error term of the regression has a constant variance). If not, I estimated the regression using White's robust standard errors. See, e.g.,

- Wooldridge, Jeffrey M., 2000, Introductory Econometrics, South-Western College Publishing, at 248-249.
- Breusch, T.S., and A.R. Pagan, September 1979, A Simple Test for Heteroskedasticity and Random Coefficient Variation, Econometrica, Vol. 47, 1287-1294.
- White, Hal, 1980, A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity, Econometrica, Vol. 48, 817-838.

[324] Wal-Mart also produced data for sales through Sam's Club. I completed two studies using the Sam's Club data, which are reported in Section X.C.2 and Exhibits 62 and 63. The results of the Sam's Club studies are consistent with the Wal-Mart study results.

[325] In some data sets the cost and price of the items sold in each individual transaction are provided; I refer to these datasets as having matched costs and prices. In these data, the cost that accompanies any given sale price is known. For other data, it is necessary to match the appropriate cost with the appropriate price for each observation. For example, many firms provided purchase data containing product costs in one dataset and provided sales data containing product prices in a different dataset. In these instances, it was necessary to match these data, ideally by each individual product and date.

The files that were used for these studies, which were provided by Wal-Mart, included actual transaction-level cost and prices as well as Wal-Mart's retail prices at the time it purchased products. I also used price lists provided by Sanyo for sales of CRT products to Wal-Mart. Transaction-level data in theory record the actual amount paid by purchasers, but these data often include extraneous information that may not accurately represent the price of an item for some transactions.[326] Price lists or suggested retail prices may not reflect the actual amount a customer paid for an item, but they do provide a starting point for any price negotiations, discounts, etc., all of which are informative of a seller's pricing practices.

In the first study, I used TV purchasing data produced by Wal-Mart. These data included Wal-Mart's weekly cost for each item,[327] and a "Retail Amount" variable, which is a measure of the retail price for each item.[328] The data were in a form in which the cost and price variables were already matched. I regressed the retail price on the cost for the TV, controlling for size and other product characteristics (manufacturer, high-definition, and TV-VCR combo). Using these data, I calculated a 110% pass-through rate. The interpretation of these results is that when Wal-Mart's cost for TVs increased by $1.00, the Wal-Mart increased the price it charged its customers increases by $1.10.

In the second study, I used the same purchasing cost data, but I matched these costs to the daily sales data produced by Wal-Mart; that is, I used price data based on store-level transactions.[329] In order to combine the data from these two sources, I calculated average weekly per-unit costs for each product, which I then matched with Wal-Mart's daily sales data. As before, I regressed the price on the cost for each item, controlling for size and other product characteristics (manufacturer, high-definition, TV-VCR combo, and month). Using these data, I calculated a

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[326] For example, a retail customer may have store credit which may be applied to the purchase price of an item. Also, it is not uncommon to observe a sales price of one cent in transaction-level data for various reasons (e.g., exchanges for defective products) but these transaction amounts are not indicative of the actual price of the item. There are many other scenarios which may distort the prices recorded in these transaction level data.

[327] See, e.g.,

- Wal-Mart produced weekly purchase data covering 11 October 2008 through 13 August 2010. Fields include the year-week, the week's beginning and ending dates, item number, item description, UPC (Universal Product Code, a unique product identifier), UPC description, vendor name and number, the gross purchase quantity, the gross purchase cost, and the gross retail (price) amount. Wal-Mart, 2010, Walmart and Sams Select Gross Ships Report 102008-102010, <<Walmart and Sams Select Gross Ships Report 102008-102010 LR35847.xls>>.
- Wal-Mart produced additional weekly purchase data covering the 21st week of 2001 through the 34th week of 2008; these data were disaggregated by store. Fields include the store number, vendor name and number, item description, item number, year-week variable, per-unit retail (price) amount, per-unit purchase cost, and purchase quantity. Wal-Mart, 2010, Sams and WMT Selected Gross Ships Report LR35989, <<Sams and WMT Selected Gross Ships Report LR35989 (1).xls>>.

[328] Per an e-mail sent by Brian Hennelly to Brian Umpierre on 11 September 2013, the price variable in Wal-Mart's purchase data (named *Gross Ship Retail $*) "is calculated on the basis of the retail price at the time the product was received at the store." Hennelly, Brian, 12 September 2013, E-mail, Subject: Fwd: In re Cathode Ray Tube (CRT) Antitrust Litig., Case No. 07-5944 (N.D. Cal.).

[329] Wal-Mart produced daily sales data for selected stores beginning on 14 January 1995 and ending on 6 October 2010. Fields include the date, the store number, the item number, item description, UPC, UPC description, vendor name and number, sales quantity, and sales amount in dollars. Wal-Mart, 2010, Walmart and Sams Selected Sales Report, <<Walmart and Sams Selected CRT Sales Report LR35846.xls>>.

106% pass-through rate. The interpretation of these results is that when Wal-Mart's cost for TVs increased by $1.00, Wal-Mart increased the price it charged its customers by $1.06.

In the third study, I used annual price lists provided by Sanyo for TVs sold from Sanyo Manufacturing Corporation to Wal-Mart between 1995 and 2007.[330] These data included an "FOB Cost" variable which represented Wal-Mart's cost to purchase products from Sanyo; these costs were already matched to the Wal-Mart suggested retail price. I regressed Wal-Mart's suggested retail price on Wal-Mart's FOB Cost controlling for the size of the TV and other features (flat screen, wide screen, HDTV, and picture-in-picture). Using these data, I calculated a 116% pass-through rate. The interpretation of these results is that when Wal-Mart's cost for TVs increased by $1.00, Wal-Mart increased the price it charges its customers increases by $1.16.[331]

While each of these studies used different data representing the cost and price at which Wal-Mart purchases and sells CRT products, these data all illustrate the pricing behavior of Wal-Mart. By analyzing these various data sources, I showed that Wal-Mart passed through cost increases to its customers at a rate over 100%. This conclusion holds whether one examines data on suggested retail prices, wholesale list prices, or actual transaction data.[332] Additionally, I have completed two additional studies, one top-to-bottom study and one top-and-bottom study, both of which used data provided by Sanyo involving products sold at Wal-Mart and likewise yield consistent results; see Section X.C.2 below.

2. Other studies

In addition to the Wal-Mart studies discussed above, I conducted 59 additional pass-through studies, which fall into three general categories: those that measure pass-through over the entire distribution channel, those that measure pass-through over multiple levels of distribution, and those that measure pass-through for an individual level of distribution.

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[330] This file contained prices and costs for Sanyo televisions sold through Wal-Mart. There was a separate price list for each year, beginning in 1995 and ending in 2007. Generally, each year contained Wal-Mart's model number, the suggested retail price at which Wal-Mart listed the product, the percent mark-up, Wal-Mart's FOB costs, an "effective date" on which price changes took effect, and a column for notes and comments about the price change. Some pages also contain a Wal-Mart item number (Wal-Mart's in-house SKU) and a group description that specifies the size of the TV as well as some other characteristics. Sanyo, 04 March 2011, CRT Pricing Info (1995-2007), <<CRT Pricing Info (1995-2007).PDF>>.

[331] I was also able to conduct a Sanyo product manufacturer pass-through study using these data and other data produced by Sanyo. I matched Sanyo's tube purchase data with FOB costs for Sanyo finished CRT products from Wal-Mart's price list, finding a pass-through rate of 150%.

[332] Similarly, I conducted multiple studies for Dell and Target that use different measures of costs and prices in each, yet yield similar results:

- Dell provided different datasets with two different measures of cost: one is purchase data with actual procurement costs, and the other is an accounting cost measure. In a letter from Rodney Ganske, Dell states that the accounting cost measure (a variable named *total_cost_usd*) "represents the measure of Cost Dell paid for the related SKU item in an order during the time period of sale." Ganske, Rodney J., 22 May 2013, Letter, Re: Dell CRT Data Questions, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).
- Target provided data with two different measures of price: one is a suggested price and the other is based on actual transactional prices.

As described in Section X.B, there are two approaches for estimating pass-through over the entire channel: by looking at the relationship between costs at the top of the distribution chain and prices at the bottom of the distribution chain (which I call the top-and-bottom approach) and by estimating the pass-through rate at each level of the distribution chain and then multiplying them (which I call the top-to-bottom approach). The top-and-bottom approach directly calculates the pass-through rate over the entire distribution channel, which I refer to as the channel-length pass-through rate.

The top-to-bottom approach calculates separate pass-through rates for individual levels of the distribution channel; the channel-length pass-through rate is obtained by multiplying all of the pass-through rates for the individual levels. For example, consider the following distribution chain in which tube manufacturer A sells tubes to tube distributor B. Tube distributor B then resells the tubes to finished product manufacturer C to manufacture CRT TVs. Product distributor D then buys those TVs from finished product manufacturer C and sells them to retailer D. Retailer D, in turn, sells them to end users. This example has four levels of distribution (tube distributor, finished product manufacturer, finished product distributor, and retailer) and I can calculate a separate pass-through rate for each. If the individual pass-through rates are 115% for tube distributor A, 109% for finished product manufacturer B, 100% for finished product distributor C, and 104% for retailer D, then the channel-length rate is 120%. The cumulative pass-through rate can be calculated by multiplying the pass-through rates at each level: 115% × 109 % × 100% × 104% = 130%. See Exhibit 66.

The top-and bottom approach calculates a single pass-through rate over the entire distribution channel by using data at the top of the channel on tube prices and data at the bottom of the channel on retail prices paid by end users for monitors or TVs that include a CRT. For example, a tube manufacturer initially increases the price of a tube by $1.00 and in response a retailer selling finished TVs that use those same tubes increases its price by $1.20, the channel-length pass-through rate is 120%. See Exhibit 67.

Both of these approaches were implemented using the same initial cost data, i.e., CRT prices charged by Defendants to direct purchasers at the top of the channel; however, different data were used at the bottom of the channel. The top-and-bottom approach used retail or "street" prices for products being sold to end-users as the downstream price.[333,334] The top-to-bottom

[333] The top-and-bottom approach does not use data from intermediate resellers. The pass-through rates of intermediate resellers are subsumed within the analysis. This approach estimates a single pass-through coefficient for the entire distribution channel.

[334] Estimating the pass-through rate for an entire distribution chain by looking at the prices at the top and bottom of the distribution chain is common in the peer-reviewed, published, scholarly economic literature. See, e.g.,

- Aaronson, Daniel, February 2001, Price Pass-through and the Minimum Wage, The Review of Economics and Statistics, Vol. 83(1), 158-169.
- Gron, Anne and Deborah Swenson, May 2000, Cost Pass-Through in the U.S. Automobile Market, The Review of Economics and Statistics, Vol. 82(2), 316-324.
- Kadiyali, Vrinda, 1997, Exchange Rate Pass-through for Strategic Pricing and Advertising: An Empirical Analysis of the U.S. Photographic Film Industry, Journal of International Economics, Vol. 43, 437-461.
- Karp, Larry S. and Jeffrey M. Perloff, March 1989, Estimating Market Structure and Tax Incidence: The Japanese Television Market, The Journal of Industrial Economics, Vol. 37(3), 225- 239.

approach incorporated data from multiple levels of the channel including as many intermediate resellers as necessary to trace specific products through the entire distribution chain from the CRT manufacturer to the end customer.[335]

I conducted three top-and-bottom studies, each of which span the entire distribution channel:

- For the first study, I used data on Sanyo's purchase of tubes from Defendants at the top of the channel matched to Wal-Mart's price list containing the retail prices for Sanyo finished CRT products sold in Wal-Mart stores. I calculated a pass-through rate of 185%; see Exhibit 68.
- For the second study, I used tube sales data from Panasonic at the top of the channel matched to TV sales data from Bestbuy.com at the bottom of the channel. The Bestbuy.com data were limited to Panasonic-brand finished products, which were likely to contain Panasonic tubes.[336] Panasonic's tube sales data were aggregated by month, size, shape (round or flat screen), and aspect ratio. These data were matched to Bestbuy.com's transaction-level retail sales data by month, size, shape, and aspect ratio. Controlling for screen size, screen shape, integrated VCRs and DVD players, and picture-in-picture capabilities, I calculated a pass-through rate of 115%; see Exhibit 68.

- Leibtag, Ephraim, Alice Nakamura, et al., March 2007, Cost Pass-Through in the U.S. Coffee Industry, United States Department of Agriculture Economic Research Service Economic Research Report Number 38.
- Nakamura, Emi and Dawit Zerom, August 2009, Accounting for Incomplete Pass-Through, NBER Working Paper 15255, http://www.nber.org/papers/w15255.
- Radchenko, Stanislav, 2005, Lags in the Response of Gasoline Prices to Changes in Crude Oil Prices: The Role of Short-Term and Long-Term Shocks, Energy Economics, Vol. 27, 573-602.
- Sumner, Daniel A., October 1981, Measurement of Monopoly Behavior: An Application to the Cigarette Industry, The Journal of Political Economy, Vol. 89(5), 1010-1019.

[335] This approach required being able to identify the customers across datasets as well as trace products across datasets, preferably by manufacturer part number and date.

[336] See, e.g.,

- The vendor for all Panasonic-brand TVs in Best Buy.com's data was Panasonic North America (PNA). See Best Buy, Undated, SKU List, BBYCRT000080.
- All finished products sold by PNA originated from its Mexican factory, referred to as PAVCA/MTNC: "Q. The televisions that you bought and then sold to your customers, they all came from Panasonic Corporation; is that correct? A. They came from MTNC, which is our factory in Mexico so... Q. Were all the televisions you sold manufactured in the same location? A. Yeah, they were all out of Mexico. As far as I know, they were all out of Mexico." 18 July 2012, Deposition of Panasonic North America 30(b)(6) Witness Edwin Wolff (Hereinafter "Panasonic 30(b)(6) Deposition of Edwin Wolff, 18 July 2012"), at 49:15 - 50:2.
- All TVs produced at PAVCA/MTNC were sold to PNA: "Q. Did all of the CRT TVs that PAVCA produced get sold to PNA? A. That is correct, for American business." Panasonic 30(b)(6) Deposition of Mishiro Kimura, 19 July 2012, at 40:11 - 13.
- PAVCA/MTNC sourced 70% of its tubes from Panasonic: "Q. Can you give your best estimate on the percentage of time where the specifications were similar enough that the tubes could be substituted? A. […] [O]f all of the CRTs, around 70 percent came from MTPDA while around 30 percent came from Samsung and others." Panasonic 30(b)(6) Deposition of Mishiro Kimura, 19 July 2012, at 93:20 - 94:6.

- For the third study, I used tube sales data from Samsung at the top of the channel matched to TV sales data from brick-and-mortar Best Buy stores at the bottom of the channel. The Best Buy data were limited to Samsung-brand finished products, which are likely to contain Samsung tubes.[337] Samsung's tube sales data were aggregated by month, size, shape (round or flat screen), and aspect ratio. These data were matched to Best Buy's transaction-level retail sales data by month, size, shape, and aspect ratio. Controlling for screen size, HDTVs, flat screens, and integrated VCRs, I calculated a pass-through rate of 155%; see Exhibit 68.

I have conducted two top-to-bottom studies:

- For the first top-to-bottom study, I used data that traced sales of CRTs through the following resellers: TAEC, TACP, and Costco.[338] I calculated a pass-through rate of 183%, which also spans the entire distribution channel; see Exhibit 69.
- For the second top-to-bottom study, I used data on Sanyo's purchase of tubes from Defendants at the top of the channel. I matched these data to a price list of Sanyo products sold in Wal-Mart stores, which include a measure of Wal-Mart's FOB costs for purchasing finished CRT products from Sanyo and Wal-Mart's retail prices for those products. I calculated a pass-through rate of 176%, which spans the entire distribution channel; see Exhibit 69.

The second general category of studies calculated pass-through over multiple levels of distribution, which I refer to as multi-level studies. These studies are similar to the top-to-bottom approach in that they calculate separate pass-through rates for each individual level and the multi-level rate is obtained by multiplying the pass-through rates for the individual levels. In the multi-level studies I traced pass-through for specific products; that is, I was able to match specific products across different datasets using individual product numbers. I conducted three multi-level studies; see Exhibit 70:

- In the first study, I used data on sales of televisions by Philips and Best Buy. Televisions in this study were manufactured by Philips, sold to Best Buy, and then resold to end-users. Both datasets were aggregated by item number and month and matched based on these criteria. I calculated a pass-through rate of 139% controlling for tube size and flat screen.
- In the second study, I used data on sales of televisions by Philips and Costco. Televisions in this study were manufactured by Philips, sold to Costco, and then resold to end-users. Both datasets were aggregated by item number and month and matched based on these criteria. I calculated a pass-through rate of 133% controlling for tube size and flat screen.

[337] Samsung Electronics Corporation (SEC), Samsung's finished product manufacturing subsidiary, purchased nearly 87% of its tubes directly from Samsung tube manufacturers and Samsung sales organizations between 2001 and 2007. Approximately 79% were purchased directly from Samsung tube manufacturers. Samsung, 2007, Samsung Electronics Corporation Tube Purchase Data 2001-2007, SEC-CRT-00000014.

[338] The data used for the tube distributor portion of this study, sales from Toshiba to TAEC, did not include sufficient information to control for product characteristics. In order to complete this study, I controlled instead for individual part numbers.

- In the third study, I used data on sales of monitors by Envision, Ingram Micro, and PC Connection. Monitors in this study were manufactured by Envision, sold to Ingram Micro, resold to PC Connection, and then resold to end-users. Each dataset was aggregated by item number and week and matched based on these criteria. I calculated a pass-through rate of 127% controlling for tube size.

Although the multi-level studies do not calculate a pass-through rate that spans the entire distribution channel, I can still make reasonable inferences about the channel-length rate. Specifically, consider the Philips-Costco study in which I calculated a pass-through rate of 133% from finished product manufacturer to end user. This study does not incorporate the tube distributor level from which Philips purchased tubes; however, in order for the channel-length pass-through rate to be less than 100%, the rate for the missing tube distributor level would have to be less than 75%, which is considerably lower than any of the pass-through rates I have calculated.

The third general category of studies calculated pass-through for a single level in the distribution channel. I conducted two pass-through studies using data provided by a CRT distributor (two because I calculated a separate pass-through rate for CDTs and for CPTs), eleven studies using data provided by CRT product makers, four studies using data provided by CRT product distributors, and 37 pass-through studies using data provided by CRT product resellers (nineteen of these studies were for brick and mortar retailers and eighteen were for online retailers).[339]

Exhibit 62 lists the calculated pass-through rates and other statistical results for each of the studies I have conducted. Exhibit 63 provides information about the firms, the data they provided, and the specification for each of the studies I have conducted. Exhibit 71 lists the files relied upon for each pass-through study.

Exhibits 72-74 plot the calculated pass-through rate and corresponding 95% confidence interval for each of the studies.[340] All 62 of the confidence intervals either include 100% or are wholly

[339] See, e.g.,

- Tube distributors: Toshiba America Electronics Corporation (TAEC).
- CRT product makers:
  - Monitors: BenQ, Envision, Philips, Tatung, Toshiba America Information Systems (TAIS), and ViewSonic are monitor makers that provided data.
  - TVs: Funai, Philips, Sanyo, Sharp, and Toshiba America Consumer Products (TACP) are TV makers that provided data.
- CRT product distributors: Arrow Electronics, Ingram Micro, and Tech Data.
- CRT product resellers:
  - Brick-and-mortar retailers: Best Buy, Costco, Fry's, Kmart, Office Max, RadioShack, Sam's Club, Sears, Target, and Wal-Mart are brick-and-mortar retailers that provided data. These brick-and-mortar stores have an online presence as well.
  - Online retailers: Amazon, Best Buy.com, Buy.com, CDW, Dell, Gateway, PC Connection, PC Mall, and Zones.

[340] A 95% confidence interval is a range that is expected to contain the actual value of interest (in this case, the pass-through rate) 95% of the time the range is estimated. Wooldridge, Jeffrey M., 2000, Introductory Econometrics: A Modern Approach, South-Western College Publishing, at 134.

above 100%. The 51 studies with confidence intervals wholly above 100% are the studies that find a pass-through rate that is statistically significantly greater than 100%. The remaining eleven studies with confidence intervals that include 100% are the studies that result in pass-through rates that are not statistically significantly different from 100%. None of the confidence intervals are wholly below 100%, meaning none of the studies result in a pass-through rate that is statistically significantly less than 100%.

D. Channel coverage

I conducted studies for all of levels of the distribution channel as described in Section VI.E. In Exhibit 75 I summarized which segments of the distribution channel were covered with each study. I presented five studies that measured pass-through from Defendants selling CRTs at the top of the channel to end customers purchasing CRT products at the bottom of the channel, and I presented three studies that measure pass-through for part of the distribution channel. Collectively, these studies covered the entire distribution channel and portions of the distribution channel, included both types of at-issue CRT products, and represented all the various types of buyers and resellers operating in the distribution channel. The total number of CRTs with unique price-cost combinations represented in these datasets was over 176 million.[341] These datasets included transactions beginning as early as February 1994 and continuing into November 2011. Exhibits 76-78 summarize the time periods covered by each study.

In an effort to obtain data that included transactions typical of those made by indirect purchasers represented in this matter, I compiled a list of third-party firms for Plaintiffs' counsel to subpoena for data that could be used to calculate pass-through rates; I specified the type of data that were needed, the format, period covered, and products included. Additional data were also provided by Defendant and Defendant-related entities through discovery. Some of the subpoenaed firms were unable to provide the requested data and some firms produced data that were insufficient to measure pass-through. For example, Zenith produced usable sales data, but was unable to provide any cost or purchase data. Similarly, some Defendants were unable to provide the data necessary to estimate pass-through and some Defendants produced data that was not usable. For example, Hitachi America Limited (HAL) provided data for finished goods sales; however, there is no variation in cost for each item over the entire period it was sold. In each of these instances, my staff attempted to work through counsel with the party producing the data in an effort to determine whether it could explain data deficiencies and/or produce additional data that would render the already produced data usable.

E. Summary: The pass-through rate is at least 100%

Based on economic theory and the results of the 62 econometric studies, I conclude that any overcharges were passed through to consumers at a rate of at least 100%. Of those studies, 51 found a pass-through rate statistically greater than 100% and eleven found a pass-through rate that was not statistically significantly different from 100%.

XI. Damages to class members are $3.076 billion

[341] This number excludes tubes from the multi-level, top-and-bottom, and top-to-bottom studies. The total number of tubes including those datasets was over 191 million.

To calculate the damages that class members suffered as a result of the conspiracy, I multiplied the revenues received by Defendants and Co-conspirators from sales to class members by the overcharge and pass-through rates. The relevant CRT revenues are those that ultimately derive from class members' purchases of monitors and TVs containing CRTs.

A. Global CRT revenues

I began by estimating total global revenues for sales of CRTs by all manufacturers, including Defendants, Co-conspirators, and other manufacturers. The transaction data produced by Defendants are insufficient to estimate Defendants' global revenues. In particular, some Defendants have not produced any data[342] and other Defendants have produced data that do not cover all shipments of CRTs.[343] I therefore estimated global CRT revenues by obtaining estimates of global CRT unit shipments from market research firms, which I then multiplied by average wholesale CRT prices based on data produced by Defendants.[344] I estimated shipments, prices, and hence revenues separately for different sizes of CPTs (color picture tubes, the type of CRTs that are incorporated into TVs) and CDTs (color display tubes, the type of CRTs that are incorporated into computer monitors).[345]

1. Global CPT and CDT unit shipments by size and manufacturer

I used data from Defendants' internal documents detailing estimates of global sales to estimate annual global CPT shipments by size and manufacturer.[346] I used similar documents, supplemented by NPD DisplaySearch reports,[347] to estimate annual global CDT shipments by size and manufacturer.[348] Some of the data are disaggregated by size and manufacturer in their

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[342] Irico, Mitsubishi, Orion, Samtel, Thai-CRT, and Thomson/Videocon have not produced CRT sales data. See Section IX.B for further discussion on Defendant data production.

[343] Some Defendants have not produced CRT sales data for one or more subsidiaries, e.g., Hitachi Singapore and Hitachi Malaysia. Other Defendant sales data are missing data for significant periods of time, e.g., the HEDUS data are missing the years 1995-1997 and the Philips data are incomplete for the years 1993-1999Q1 and absent completely for the time between 1999Q2 and the beginning of the LG-Philips joint venture in 2001.

[344] Market research firms do not have data on global revenues.

[345] I estimated shipments and prices separately for different sizes of CPTs and CDTs. The sizes of CPTs (in inches) are: 10, 11, 14, 15, 16, 17, 19, 20, 21, 22, 24, 25, 26, 28, 29, 32, 33, 34, 36, 37, and 38. The sizes of CDTs (in inches) are: 10, 12, 14, 15, 16, 17, 19, 20, 21, 24, 28, 29, 32, 34 and 36.

[346] Worldwide shipments of CPTs:

- Hitachi Displays, 2002, Untitled Spreadsheet, HDP-CRT00019322.
- MT Picture Display, November 2006, Untitled Spreadsheet, MTPD-0416090, at Tab 'Supply DB'.

[347] NPD DisplaySearch is a market research firm specializing in coverage of the display supply chain and related industries. It counts several Defendants among its clients. See footnote 280.

[348] Worldwide shipments of CDTs:

- Hitachi Displays, 2002, Untitled Spreadsheet, HDP-CRT00019322.
- DisplaySearch, 2003, DisplaySearch Quarterly Desktop Monitor Shipment and Forecast Report Q1'03, CHWA00106460 - CHWA00106757.
- DisplaySearch, 2003, Quarterly Desktop Monitor Shipment and Forecast Report, CHWA00062147 - CHWA00062569.

original form. Where they are not, I estimated the disaggregation using supplemental data from Defendants' internal documents and NPD DisplaySearch.

These sources did not include data for global shipments of CDTs or CPTs in 2007. I estimated shipments in 2007 by using the data for other years to predict 2007 shipments. I used regression analysis of CDT and CPT shipments to estimate the time trend of shipments and then applied this trend to the 2006 data to estimate the volume of shipments in 2007.

2. Global CPT and CDT wholesale prices by size and manufacturer

To translate shipment sales to revenues, I used Defendants' sales data to estimate the annual price per tube for different sizes of CPTs and CDTs; see Exhibit 64 for a list of Defendants' sales data sources. For each size of CDTs and CPTs, I estimated the annual price by Defendant using each Defendant's own sales data. For manufacturers that did not produce sales data, I set annual prices by size equal to the average of prices as recorded in the Defendant sales data.[349]

3. Global CPT and CDT revenues by size and manufacturer

I multiplied the annual global unit shipments by size and manufacturer by the corresponding wholesale price to calculate annual total global revenues by manufacturer for each size CDT and CPT.

4. Adjustment for class period

I adjusted the global CPT and CDT revenue estimates in years 1995 and 2007 to account for the fact that the class period is March 1, 1995 through November 25, 2007. For each of these years, I multiplied global revenue estimates by the fraction of the year that is included in the class period.

B. Defendants' and Co-conspirators' global CRT revenues

Defendants and Co-conspirators accounted for a substantial majority of global CRT sales during the class period, but other firms produced CRTs as well. To estimate Defendants' and Co-conspirators' global CRT revenues during the damages period, I estimated annual global market shares by tube manufacturer. I then multiplied the market share by annual global revenues to arrive at global revenues for each Defendant and Co-conspirator.

- DisplaySearch, 07 July 2005, Q2'05 Quarterly Desktop Monitor Shipment and Forecast Report, CHWA00088192 - CHWA00088762.
- DisplaySearch, 30 September 2005, Q3'05 Quarterly Desktop Monitor Shipment and Forecast Report, CHU00281352 - CHU00281923.
- DisplaySearch, 30 March 2007, Q1'07 Quarterly Desktop Monitor Shipment and Forecast Report, CHU00154037 - CHU00154420.
- DisplaySearch, 28 September 2007, Q3'07 Quarterly Desktop Monitor Shipment and Forecast Report, LGE00076321 - LGE00076707.
- Samsung, 11 December 2003, Worldwide CDT Manufacturer's Status, SDCRT-0201291.
- Undated, CDT maker sales, CHU00071226.

[349] I estimated average annual prices by size across all manufacturers by dividing total revenues by total shipments.

To estimate market shares, I used the same data sources that I used to estimate total global CRT shipments.[350] These data contain Defendants' shares of global shipments rather than Defendants' share of global revenue; shipment shares differ from revenue shares to the extent that different manufacturers sold products at different wholesale prices. In order to convert quantity shares to revenue shares, I used average tube wholesale prices by Defendant by year, based on tube sizes sold by each Defendant.

1. Defendants' and Co-conspirators' shares of global CPT revenues

The CPT global unit shipment data include quarterly shipments by manufacturer for 1998 and 2000-2006. To estimate Defendants' market shares for 1995-1997, I set the market share equal to the 1998 value. To estimate Defendants' market shares for 1999, I used the weighted average market share for 1998 and 2000. To estimate Defendants' market shares for 2007, I used the share from 2006.

2. Defendants' and Co-conspirators' shares of global CDT revenues

The CDT global unit shipment data include annual shipments by manufacturer for 1996-1997 and quarterly shipments by manufacturer for 1998-2003 and 2004 Q2-2006. To estimate shares for 1995, I set each manufacturer's market share equal to its 1996 value. For 2004 Q1, I used the average of a firm's 2003 Q4 and 2004 Q2 market share. To estimate market shares for 2007, I used the share from 2006.

C. U.S. share of Defendants' and Co-conspirators' global CRT revenues

Next, I estimated the share of Defendants' and Co-conspirators' global CRT revenues that was attributable to sales of TVs and monitors in the U.S. Almost all of the available data on geographic shares of global CRT sales present data on CRTs that were consumed in the U.S. as part of sales to "NAFTA" or "North America".[351] To isolate U.S. consumption, I estimated the share of CPTs and CDTs consumed in the U.S. and Canada by estimating consumption when data were missing and excluding consumption in Mexico. I then excluded consumption in Canada to arrive at estimates of the share of CRTs consumed in the U.S.

This approach to estimating the amount of Defendants' and Co-conspirators' CRT revenues attributable to consumption in the U.S. assumes that the U.S. consumed the same mix of CPT and CDT sizes and types as the rest of the world. In fact, the U.S. likely consumed a higher proportion of larger, more expensive CRTs. For example, HDP-CRT00057341.xls contains estimates of demand for CPT by tube size and region. NAFTA countries (U.S., Canada, and Mexico) accounted for approximately half of demand for CPTs 30 inches or larger, but accounted for less than 20% of demand for all CPTs in the late 1990s. These data are insufficient to separately estimate the share of CPTs and CDTs by size that are consumed in the U.S. but they provide evidence that my approach tends to underestimate the share of large CRTs sold to the U.S. and overestimate the share of small CRTs sold to the U.S. The net effect should be to underestimate total revenues attributable to the U.S., and thus leads to a conservative estimate of the commerce affected by the CRT price-fixing cartel.

[350] See footnotes 346 and 348.

[351] NAFTA and North America both include the U.S. and Canada and, depending on the source, sometimes Mexico.

1. Share of CPTs consumed in the U.S.

To calculate the share of worldwide CPT production ultimately consumed in the U.S., I started with data from two sources.[352] One source includes data on the share of CRT TV sales to the U.S., Canada, and Mexico for the years 1998-2000 and the other source includes data for the years 2004-2007. First, I excluded sales to Canada and Mexico. I then estimated the U.S. share for the missing years, 1995-1997 and 2001-2003.

I estimated each country's share of North American CPT consumption by calculating its share of nominal domestic demand measured in U.S. dollars at purchasing power parity.[353] I then excluded the share of CPT revenue attributable to sales of TVs in Canada and Mexico.

To estimate the U.S. share of CPT consumption for 1995-1997, I used the 1998 share. To estimate the U.S. share for 2001-2003, I interpolated the missing years by assuming that the U.S. share declines linearly from the 2000 share of 16.0% to the 2004 share of 14.9%. See Exhibit 79.

2. Share of CDTs consumed in the U.S.

To calculate the share of worldwide CDT production ultimately consumed in the U.S., I started with data on the share of CRT monitors sold to the U.S. and Canada from 1999-2007.[354] I excluded sales to Canada using the same method as for CPTs. I then estimated the U.S. share of CDT consumption for the missing years (1995-1998) by setting the share in those years equal to the share in 1999. See Exhibit 79.

D. Elimination of government purchases

Government entities are not a part of the class; therefore, I excluded U.S. revenues that are derived from government purchases. To calculate the share of revenues resulting from government purchases, I used data on the breakdown of computer sales between government entities and private consumers, which are available from the U.S. Bureau of Economic Analysis (BEA, part of the Department of Commerce).[355] Using the BEA data results in a conservative estimate of class revenues for televisions because the government share of television purchases is likely to be smaller than the government shares of computer purchases. See Exhibit 79.

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[352] North American shares of CPTs:

- Data from DisplaySearch contain shipments of TVs to the U.S. and Canada for the years 2004-2010. DisplaySearch, May 2011, Analysis Group, Inc. Custom Data Project, DISP_LCD_000129.
- Data from the Japanese Electronics and IT Industries Association contain shipments of CPTs to the U.S., Canada, and Mexico for the years 1998-2000. Japanese Electronics and IT Industries Association, June 2001, Worldwide CPT Demand by Area, HDP-CRT00057341.

[353] Domestic demand is the sum of consumer spending, government spending, and business spending. It is also equal to gross domestic product (GDP) less net exports and change in inventories. I obtained the data from the OECD. OECD.StatExtracts, Undated, National Accounts, http://stats.oecd.org/Index.aspx?DataSetCode=SNA_TABLE1, accessed 01 October 2013.

[354] North American shares of CDTs:

- Data from DisplaySearch contain shipments of computer monitors to the U.S. and Canada for the years 1999-2010. DisplaySearch, May 2011, Analysis Group, Inc. Custom Data Project, DISP_LCD_000129.

[355] Bureau of Economic Analysis, 28 April 2011, Final Sales of Domestic Computers, http://www.bea.gov/national/xls/comp-gdp.XLS, accessed 12 May 2011.

E. Revenues from class members

Only residents living in certain states are part of the Indirect Purchaser State Classes.[356] In order to calculate the share of Defendants' and Co-conspirators' non-governmental U.S. revenue that accrues from sales in Class States, I assumed that CRT end-product sales are distributed across states according to population. That is, I allocated the total non-governmental U.S. revenues to class states based on population shares.[357]

Using this process, I estimated that, over the entire class period, 8.6%[358] of Defendants' and Co-conspirators' worldwide CRT revenue is attributable to indirect purchases by class members. See Exhibit 79. This amounts to a total of $17.5 billion of revenue attributable to purchases by class members. See Exhibit 80.

F. Total damages

In order to calculate dollar overcharges to direct purchasers, I multiplied the total annual class tube revenues by the annual overcharge percentages, which are discussed in Section IX. I calculated dollar overcharges separately for each application type (CPTs and CDTs) as well as separately for two groups of CRT manufacturers, Defendants and Co-conspirators. In order to convert these direct purchaser dollar overcharges to the damages suffered by class members, who are indirect purchasers, I multiplied the direct purchaser dollar overcharges by the pass-through rate, which is discussed in Section X. I used a pass-through rate of 100%, which provides a conservative estimate of total damages to class members since pass-through estimates are 100% or more. The total damages estimate is $3.076 billion. See Exhibit 81.

Appendix 1: The basic economics of cartels

This discussion was previously submitted as Section V in my class certification report. It is reproduced (with some very slight editing) here for convenience.

A. Cartel "success" harms its customers

A cartel is a group of firms that explicitly coordinates its pricing or output activities. The objective of a cartel is to increase cartel members' prices and profits above the level that would prevail in the absence of the cartel.[359] Accordingly, I consider a cartel to be "successful" or "effective" if its members are able to charge prices above those that would have prevailed absent

[356] See Section II.A.

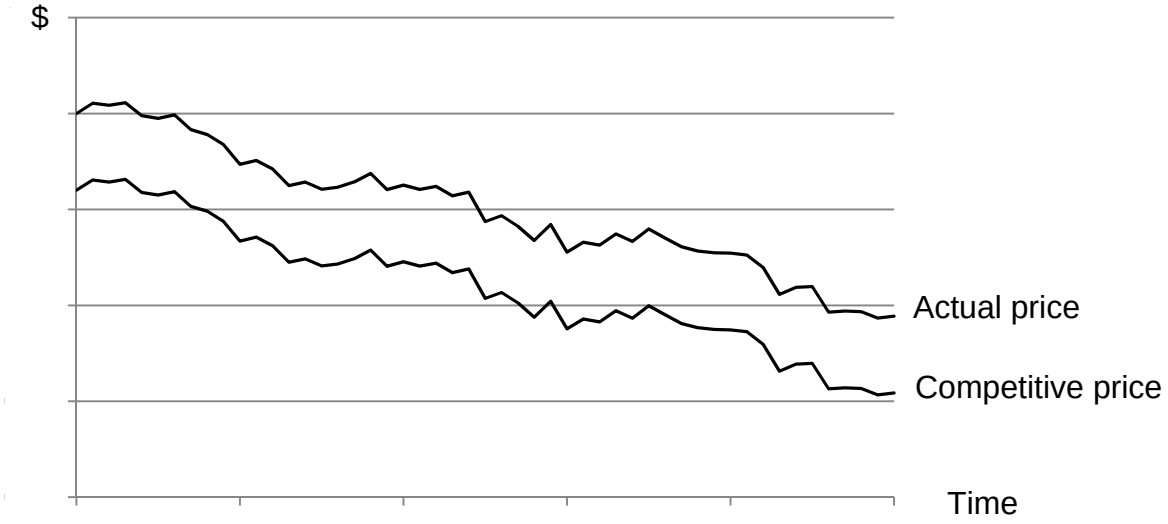
[357] Census Bureau, Undated, 1990 to 1999 State Population Estimates, http://www.census.gov/popest/archives/1990s/ST-99-03.txt, accessed 22 May 2009 and Census Bureau, December 2009, Population, population change and estimated components of population change: April 1, 2000 to July 1, 2009 (NST-EST2009-alldata), http://www.census.gov/popest/national/files/NST_EST2009_ALLDATA.csv, accessed 19 May 2011.

[358] Revenue-weighted average across all products and years.

[359] "In any market, firms have an incentive to coordinate their production and pricing activities to increase their collective and individual profits by restricting market output and raising the market price. An association of firms that explicitly coordinates its pricing or output activities is called a cartel." Carlton, Dennis and Jeffery M. Perloff, 2005, Modern Industrial Organization, Fourth Edition, Addison-Wesley Longman, Inc., at 122.

the cartel. I call the price that would have prevailed absent the cartel the "competitive price"[360] or the "but-for price". A "successful" cartel, as I use the term, necessarily causes antitrust harm.

Causing price to be above the competitive level is often referred to as "raising" price; this terminology can be confusing, especially when observed prices decline over time. The chart below illustrates hypothetical supra-competitive prices that decline over time:



The line in the chart above labeled "actual price" shows the prices that were actually charged by the cartel; they decline over time.[361] The line labeled "competitive price" shows the prices that would have prevailed absent the cartel. The cartel overcharge is the amount by which the actual price is above the competitive price. When I refer to the cartel "raising price", I mean that the price charged by cartel members is above the competitive price; equivalently, that the cartel imposed an overcharge. As the chart above illustrates, "raising the price above the competitive level" can occur when prices are falling over time: the price "rises" relative to the competitive price, it does not necessarily rise over time.

Similarly, "raising price" does not necessarily result in above-normal profit. In certain circumstances, an industry may be subject to below-normal profitability.[362] In such cases, a cartel may eke out merely normal (or even below-normal) profit. Such a cartel is nonetheless successful if it charges a higher price than would exist absent the cartel: making a dollar of profit

[360] The "competitive price" is not to be confused with the equilibrium price in a perfectly competitive market. Most markets are not perfectly competitive even if free of monopolizing conduct such as cartelization; the "competitive price" is therefore not, in general, equal to the equilibrium price in a perfectly competitive market.

[361] The cause of the decline in prices is assumed for the purpose of this discussion to be unrelated to the conduct of the cartel. For the purpose at hand, the reason for the decline is immaterial to the point under discussion. In the actual world, prices may decline over time for many reasons unrelated to cartel conduct; for example, prices may decline over time if costs decline over time.

[362] Profit is "normal" if firms earn a rate of return equal to their cost of capital. Long-term sub-normal profitability can occur if industry capacity is substantially in excess of current and probable future demands, and rigidities retard the reallocation of capital to more profitable uses. In Section VI.C.2, I show that these conditions prevailed in the CRT industry during the proposed class period.

at the cartel price is better than earning a dime at the competitive price. A cartel has succeeded if the price it charges is above the competitive price.

B. Cartel incentives: monopolization and cheating

1. Cartel success

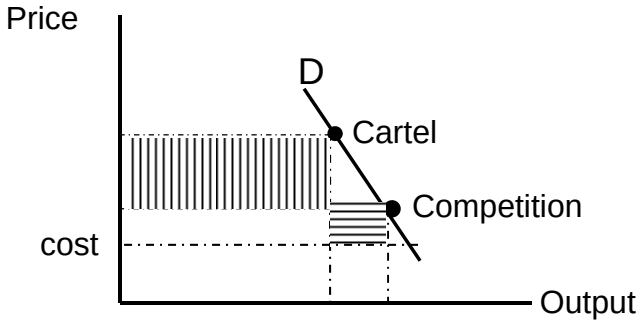
If all firms in a market join a cartel, then the cartel can function like a monopolist: when cartel members' conduct is unified, the cartel can control the market price and output like a monopoly, set the monopolist's profit-maximizing price and output, and collect monopoly profits, as long as cartel profits do not attract entry by others.[363] If fewer than all of the firms in a market form a cartel, or if entry into the market occurs, the cartel can still raise price and earn supra-competitive profits, though not as effectively as a cartel that includes all suppliers in a market in which no entry occurs.

To be successful, a cartel must possess market power. To illustrate, consider a hypothetical cartel that includes all suppliers of paper clips. Consumers may be able to avoid paying cartel overcharges for paper clips by switching to substitutes, such as binder clips and staples, if these other products are supplied by firms outside the cartel. In that case, substitution to these other products would prevent the hypothetical cartel from raising the price of paper clips significantly above the competitive level. If the cartel were broadened to include all suppliers of all paper fastening products, the cartel could prevent substitution away from paper clips to other paper fasteners by raising the prices of all paper fastening products. Only if the cartel controls all sufficiently good substitutes and consumers are willing to pay supra-competitive prices can a cartel raise price above the competitive level. In sum, cartel success requires market power.

Market power is the ability to profitably raise price by restricting output.[364] I illustrate this definition with the aid of the following diagram:

[363] "A cartel that includes all firms in a market is in effect a monopoly, and the member firms share the monopoly profits… If a few large firms make most of the sales in a market, and if they coordinate their activities, they can raise price without involving all the other (smaller) firms in the market. For example, Spain and Italy, which controlled 80% of the world's production of mercury, formed a successful cartel that did not formally involve five other producers." Carlton, Dennis, and Jeffery M. Perloff, 2005, Modern Industrial Organization, Fourth Edition, Addison-Wesley Longman, Inc., at 122 and 135.

[364] Areeda, Philip E., Hovenkamp, Herbert, et al., 2007, Antitrust Law: An Analysis of Antitrust Principles and Their Application, Volume IIB, Third Edition, Aspen Publishers, at ¶501.



In this diagram, price is on the vertical axis and output (quantity) is on the horizontal axis. The sloping line labeled "D" is the market demand curve; it shows, for each price, the amount of output that will be purchased by buyers. In general, buyers will purchase more output at lower prices than at higher prices; equivalently, sellers can extract a higher price when they supply less output. The dashed line labeled "cost" is the cost of producing additional output when output is near the competitive level. The point labeled "Competition" shows the competitive price and the quantity demanded at the competitive price.

If a cartel restricts output below the competitive level, it can charge a higher price because the demand curve is downward sloping; the cartel-restricted combination of price and output is the point on the demand curve labeled "Cartel". The increase in cartel profit due to the restriction of output is equal to the area shaded vertically (the increase in profit due to charging a higher price) minus the area shaded horizontally (the reduction in profit due to lower sales).

I show that the CRT cartel possessed significant market power in Section VIII.A.2.

a) Restricting output causes price to rise

Because the market demand curve determines price given output (or output given price), there are two fundamental mechanisms by which a cartel can cause price to rise. The first is to simply set prices above the competitive level; this implicitly causes output to be below the competitive level because buyers purchase less output at higher prices (as determined by the demand curve). The second mechanism is to restrict output below the competitive level, which implicitly causes price to be above the competitive level, again as determined by the demand curve. The two mechanisms are equivalent: each causes price to rise. The CRT cartel employed both mechanisms, price setting and output restriction through capacity restriction, to cause price to increase.[365]

b) Output can be "restricted" even when it is growing over time

The phrase "restricting output" is subject to the same confusion as the phrase "raising price". Both "raising" and "restricting" in the context of a cartel refer to comparisons with the competitive level, not to changes over time: output may be "restricted" (below the competitive level) even though it is increasing over time, just as price can be "raised" (above the competitive level) even when it is falling over time. A graph illustrating "restricted" output would look

[365] For example, notes of a cartel meeting say in part, "17" CDT production will stop for 5 days (25 operating days) to adjust the actual production volume in order to maintain the price level." Samsung SDI, May 1999, Report on the CDT management meeting results (May of '99), SDCRT-0086632 - SDCRT-0086633, at 6632E, emphasis added. For a more complete description of the CRT cartel's control of both price and output to cause price to rise, see below at Sections VIII.A.3.b) andVIII.A.3.c).

similar to the graph in the previous section illustrating "raised" price: it would show two lines increasing over time; the higher of the two lines would represent the competitive level of output, and the lower line would be below the actual level ("restricted"), despite the fact that the actual output increases over time.

c) Anticompetitive harm exceeds overcharges

The harm to consumers caused by cartel overcharges is greater than simply the overcharges themselves. As illustrated in the graph above, consumers purchase fewer units of a good at the cartel price than the lower, competitive price. For ease of exposition, suppose that 100 consumers would have purchased one CRT product each at the competitive price, and only 90 consumers bought CRT products at the higher cartel price. Overcharge damages are the harm caused by the cartel to the 90 consumers that bought CRT products at the cartel price. The 10 consumers that did not purchase CRT products at the cartel price were harmed by the cartel, too, and this harm is not included in overcharge damages. They were harmed because they would have preferred to buy a CRT product at the competitive price, but were induced by the cartel overcharge to spend their money on other goods instead.

2. Cartel cheating

Even when a cartel includes all the firms in a market, it differs from a monopoly in that it is comprised of individual firms. Each member of a cartel has two fundamental incentives. One incentive is to cooperate with the cartel's policies, because unity of action offers the possibility of sharing in monopoly profits. The other incentive is to "cheat" on the cartel agreement, because cheating increases the profits the firm earns. By cheating, a firm gains sales and higher profits in the near term, while enjoying the protection of the cartel from unbridled price competition.[366] These two incentives pull cartel members in opposite directions – to price high and to price low. However, unless cheating is ubiquitous, cartel cheaters' prices are still above the competitive level. This is because the cartel members that cooperate with cartel policy provide a "price umbrella": buyers must pay the supra-competitive cartel target price if they don't buy from cheaters, so cheaters can sell at prices above the competitive level.[367]

a) Mechanisms to address cheating

Successful cartels develop ways to address members' incentive to cheat.[368] Cartel members' incentive to cheat is constrained to some extent by their incentive to perpetuate the cartel and share in the fruits of monopolization.[369] Cartel members may monitor each other for compliance

[366] "[A]lthough it is in the cartel's best interest for every firm to restrict output [raise price], it is in [each cartel member's] best interest for [every other cartel member] to restrict output [raise price]." Carlton, Dennis, and Jeffery M. Perloff, 2005, Modern Industrial Organization, Fourth Edition, Addison-Wesley Longman, Inc., at 126.

[367] I provide a more formal explanation of why cheaters' prices are above the competitive level in Section VIII.A.3.b).

[368] "Sophisticated cartel organizations are also able to develop multipronged strategies to monitor one another to deter cheating." Levenstein, Margaret, and Valerie Suslow, March 2006, What Determines Cartel Success?, Journal of Economic Literature, Vol. 44, 43-95, at 43.

[369] "Following George Stigler (1964), many economists assume that incentive problems undermine attempts by firms to collude to raise prices and restrict output. But the potential profits from collusion can create a powerful incentive as well." Levenstein, Margaret, and Valerie Suslow, March 2006, What Determines Cartel Success?, Journal of Economic Literature, Vol. 44, 43-95, at 43.

with cartel policy regarding pricing and output. Cartels may establish mechanisms for punishing cheaters, such as trigger prices: if a cartel member charges a price below the trigger price, the cartel authorizes a price war to punish the cheater. Excess capacity may be held in order to make credible the threat of a price war. However, price wars and holding excess capacity are expensive for those doling out the punishment as well as for those receiving punishment.[370] Empirical studies find that cartels tend to avoid such expensive strategies by developing methods to monitor each other, encourage cooperation, and physically prevent cheating.[371]

One efficient mechanism for limiting cheating is to impose restrictions in capacity, such as temporary shut-downs of capacity. Such capacity restrictions are generally easily monitored and commit cartel members to output restrictions, depriving them of opportunities to cheat by limiting their ability to fill orders. Output restrictions, as noted above, cause prices to be above competitive levels.

b) Cheating is not necessarily fatal to cartel success

While some cartels break up due to cheating, many cartels continue to operate in the face of cheating.[372] Moreover, cartels can survive episodes of extended price wars to re-establish supra-competitive prices after the price war has subsided.[373] Cheating may even be an integral part of a properly functioning and successful cartel.[374]

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[370] Moreover, there is a contrary view of the role of excess capacity in cartel members' incentives: while holding excess capacity makes the threat of a price war credible, it may also raise the incentive to cheat by reducing marginal cost and thereby raising the profitability of additional sales. One theoretical study finds "support for the *conventional view* that periods of low demand lead, through the emergence of excess capacity, to a breakdown of collusive pricing… a large body of empirical evidence supports this view." Staiger, Robert W., and Frank A. Wolak, 1992, Collusive Pricing with Capacity Constraints in the Presence of Demand Uncertainty, The RAND Journal of Economics, Vol. 23(2), 203-220, at 203.

[371] "Although the evidence shows that cartels use a range of punishment mechanisms to deter cheating, including both 'price wars' and side payments, successful cartels do not simply rely on ex post punishments. Instead, they invest in monitoring mechanisms, such as joint sales agencies or regular reporting to one another or third parties. Cartels much prefer to develop the means to monitor each other's behavior in order to deter or physically prevent cheating, rather than resorting to expensive punishments such as price wars." "Successful cartels develop mechanisms for sharing information, making decisions, and manipulating incentives through self-imposed carrots and sticks." Levenstein, Margaret, and Valerie Suslow, March 2006, What Determines Cartel Success?, Journal of Economic Literature, Vol. 44, 43-95, at 44 and 86.

[372] "Cartels break up occasionally because of cheating or lack of effective monitoring, but the biggest challenges cartels face are entry and adjustment of the collusive agreement in response to changing economic conditions." Levenstein, Margaret, and Valerie Suslow, March 2006, What Determines Cartel Success?, Journal of Economic Literature, Vol. 44, 43-95, at 43.

[373] "The very successful bromine cartel lasted from 1885 to 1902. During its reign, the average price of bromine was about 25 percent higher than the average in the years before the cartel's formation. There were only three periods of extended price wars over the cartel's roughly 20 year life span… The pool fell apart and the price of potassium bromide (the major bromine product) plunged 45 percent in two months." Carlton, Dennis W., and Jeffrey M. Perloff, 2005, Modern Industrial Organization, Fourth Edition, Pearson Addison Wesley, at 140.

[374] "Thus, we demonstrate that deliberate and unpunished price cuts and business stealing (which would appear to observers as 'cheating') can be critical to the healthy functioning of a cartel." Bernheim, B. Douglas and Erik Madson, March 2014, Price Cutting and Business Stealing in Imperfect Cartels, NBER Working Paper Series 19993, at 6.

c) Whether a cartel succeeds is an empirical question unresolvable by theory or industry characteristics

Whether a cartel will succeed in increasing price above the competitive level is determined by which of the two fundamental incentives dominates, the incentive to monopolize or the incentive to cheat. While economic theory tells us that cartel members are subject to both incentives, economic theory alone cannot tell us which incentive prevails in a particular situation: whether a cartel succeeds is an empirical question. Certain industry characteristics tend to be correlated with the presence of cartels or with cartel success, but successful cartels exist in industries with a wide variety of characteristics.[375] For example, it is often said that cartels are more likely to be found in concentrated industries; yet successful cartels have operated in quite unconcentrated industries.[376] Whether a cartel has succeeded is therefore an empirical question that cannot be resolved by examining the characteristics of an industry.

3. Vertically integrated firms profit from upstream cartels

Some members of the CRT cartel were vertically integrated; that is, in addition to making CRTs, some cartel members made CRT TVs and/or CRT computer monitors as well.[377] Vertically integrated firms profit from a CRT cartel as do their unintegrated counterparts. For unintegrated firms, the benefit of price-fixing is straightforward: these firms profit by selling tubes at cartel prices rather than lower, competitive prices. Vertically integrated companies also profit by raising the price of CRTs. Economists have studied cartels with vertically integrated firms using sophisticated theoretical models and empirical methods. A recent paper in a prominent scholarly economics journal studied incentives for collusion and vertical integration by firms in upstream markets (exactly the situation in the case at hand), and found that vertical integration facilitates collusion.[378] In the model of an industry that is initially unintegrated, at least one firm will vertically integrate in equilibrium, but integration may stop well before all firms are vertically integrated, which helps explain "why a limited degree of vertical merger may be profitable in industries aiming to collude. This is interesting since many industries seem to have the feature

[375] "[M]any economists assume that incentive problems undermine attempts by firms to collude to raise prices and restrict output. But the potential profits from collusion can create a powerful incentive as well. Theory cannot tell us, a priori, which effect will dominate: whether or when cartels succeed is thus an empirical question." "There is considerable variety in the type of products and industries where collusion appears." Levenstein, Margaret, and Valerie Suslow, March 2006, What Determines Cartel Success?, Journal of Economic Literature, Vol. 44, 43-95, at 43 and 57.

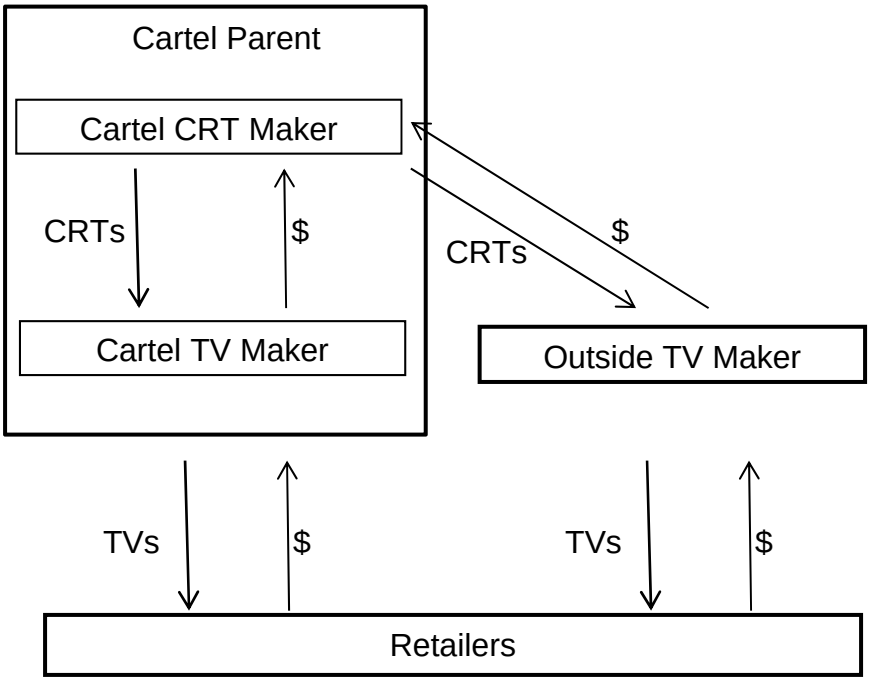
[376] "[I]ndustry concentration makes collusion easier, both by simplifying the coordination issues and by increasing firms' gains from collusion. But successful cartels have operated in a wide variety of industries by developing organizations that can overcome these challenges. There are in fact many successful cartels in quite unconcentrated industries, but they almost always rely on industry associations." Levenstein, Margaret, and Valerie Suslow, March 2006, What Determines Cartel Success?, Journal of Economic Literature, Vol. 44, 43-95, at 44.

[377] For example, before acquiring Thomson's CRT operations, Videocon produced glass components and CRT televisions. After the acquisition of Thomson's CRT factory in Anagni, Italy, Videocon was fully vertically integrated from "[s]and to TV." Videocon, Undated, Videocon International Ltd Welcomes You, PHLP-CRT-035382, at 6. For a description of vertical relationships among cartel members' subsidiaries, see Section VI.D.

[378] "In a vertically unintegrated industry, a [single] vertical merger [resulting in a mix of integrated and unintegrated firms, as in the CRT industry] facilitates collusion." Nocke, Volker, and Lucy White, September 2007, Do Vertical Mergers Facilitate Upstream Collusion?, The American Economic Review, Vol. 97(4), 1321-1339, at 1329, 1330, and 1332.

that vertically integrated firms compete with separated ones."[379] The equilibrium in this model is similar to the structure of the CRT industry, with its mix of vertically-integrated firms and unintegrated firms. Other economic models are also consistent with a cartel comprised of vertically-integrated and unintegrated firms.[380]

For ease of exposition, I explain the sources of gain to a vertically-integrated firm using a stylized example. "Cartel Parent" is a CRT cartel member that owns a CRT manufacturing subsidiary called "Cartel CRT Maker". Cartel CRT Maker sells CRTs to two TV manufacturers, "Cartel TV Maker", a sister company owned by Cartel Parent, and "Outside TV Maker", a firm unaffiliated with cartel members. The TV manufacturers engage in horizontal competition in the sale of TVs to retailers. The following diagram illustrates the relationships:



When the cartel raises the price of CRTs, the profitability of the vertically integrated firm is enhanced in at least two ways. First, Cartel Parent receives a supra-competitive price from non-

[379] Nocke, Volker and Lucy White, September 2007, Do Vertical Mergers Facilitate Upstream Collusion?, The American Economic Review, Vol. 97(4), 1321-1339, at 1332.

[380] Riordan and Salop (1995), for example, explain how instances in which the downstream division of a vertically integrated firm purchases inputs from other input makers – as occurs in the present case – can help monitor the behavior of the upstream manufacturers. "Vertical mergers might be able to increase the likelihood of tacit or express coordinated conduct by facilitating the exchange of pricing and other competitively sensitive information among the competing input suppliers. [footnote: The 1984 DOJ Merger Guidelines offer a related theory of how vertical mergers can facilitate information exchange among competitors. See 1984 DOJ Merger Guidelines §4.221, *supra* note 5, at 20,566-57…] Assuming that the integrated firm does not satisfy all of its input requirements, but rather continues to purchase part of its requirements from other input suppliers, the downstream division will receive price quotes and competitive information from rival input producers. The downstream division can transfer this information to its upstream division." Riordan, Michael H., and Steven C. Salop, 1995, Evaluating Vertical Mergers: A Post-Chicago Approach, Antitrust Law Journal, Vol. 63, at 513-568.

cartel TV manufacturers (Outside TV Maker in the diagram above); this is the same as the mechanism by which unintegrated cartel members profit. The elevated CRT price charged internally (by Cartel CRT Maker to Cartel TV Maker) does not benefit the parent company directly; the money simply goes from one pocket of the parent company to another.

The second way the vertically integrated firm benefits from the cartel's elevation of the CRT price is by allowing its TV subsidiary (Cartel TV Maker) to charge a higher price for TVs. When the cartel raises the price of CRTs, the cost of producing TVs rises for unintegrated downstream firms (such as Outside TV Maker in the diagram). Outside TV Maker responds to the cost increase by increasing the prices of its CRT TVs. Cartel TV Maker is a horizontal competitor of Outside TV Maker, so when Outside TV Maker raises its price, Cartel TV Maker raises its television price, too, and earns supra-competitive profit. Consumers face higher CRT TV prices whether they purchase from Cartel TV Maker or Outside TV Maker. Therefore, the cartel price for tubes increases the profit of the vertically-integrated cartel member (Cartel Parent). Vertically integrated CRT-TV or CRT-monitor manufacturers increase profits by joining a cartel in CRTs.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief. This declaration was executed on the 15th day of April 2014, at Ann Arbor, Michigan.

JANET S. NETZ

Subscribed and sworn to before me this 15 day of April 2014.

Notary Public

BRIAN PAUL ROSEWARNE
Notary Public, State of Michigan
County of Washtenaw
My Commission Expires May. 20, 2014
Acting in the County of

My commission expires: _____

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Dr. Janet S. Netz

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Education

Ph.D. economics, University of Michigan, 1992
M.A. economics, University of Michigan, 1990
B.A. economics, University of California at Berkeley, 1986, *cum laude*

Employment

Founder and Partner, applEcon, May 2001 to present
Visiting Associate Professor, University of Michigan, Fall 2001, Fall 2002, Fall 2003
Associate Professor, Purdue University, Fall 2001 to January 2003
Visiting Assistant Professor, University of Michigan, Winter 2001
Assistant Professor, Purdue University, Fall 1994 to Spring 2001
Assistant Professor, University of Delaware, Fall 1992 to Summer 1994

Courses Taught

Industrial Organization (undergraduate and doctoral)
Antitrust and Regulation (undergraduate)
Intermediate Microeconomics (undergraduate and master's)
Microeconomic Principles (undergraduate)
International Economics (undergraduate and master's)

Honors and Awards

Outstanding Antitrust Litigation Achievement in Economics, awarded by the American Antitrust Institute, for work In re TFT-LCD Antitrust Litigation, 2013.

Publications

"Are All Men's College Basketball Players Exploited?", with Erin Lane and Juan Nagel, *Journal of Sports Economics*, 2012 (forthcoming).

"Price Regulation: Theory and Performance", in *Regulation and Economics*, Roger J. Van den Bergh and Alessio M. Pacces, eds., Edward Elgar Publishing, 2011.

"Sports Trivia: A Review of The Economics of Intercollegiate Sports by Randy R. Grant, John Leadley, and Zenon Zygmont", *Journal of Economic Literature*, 47(2), June 2009, 485-489.

"One-Way Standards as an Anti-Competitive Strategy", with Jeffrey K. MacKie-Mason, in *Standards and Public Policy*, Shane Greenstein and Victor Stango, eds., Cambridge Press, 2007.

"International Integration and Growth: A Further Investigation on Developing Countries", with Claire Economidou and Vivian Lei, *International Advances in Economic Research*, 12(4), November 2006, 435-448.

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"International Integration and Growth: A Survey and Empirical Investigation", with Vivian Lei and Jon D. Haveman, *Review of Development Economics*, 5(2), June 2001.

"Price Regulation: A (Non-Technical) Overview", in *Encyclopedia of Law and Economics*, Boudewijn Bouckaert and Gerrit De Geest, eds, Edward Elgar and University of Ghent, 2000.

"Exercising Market Power in Proprietary Aftermarkets," with Severin Borenstein and Jeffrey K. MacKie-Mason, *Journal of Economic and Management Strategy*, 9(2), Summer 2000, 157-188.

"All in the Family: Family, Income, and Labor Force Attachment", with Jon D. Haveman, *Feminist Economics*, 5(3), November 1999, 85-106.

"Why Do All Flights Leave at 8am?: Competition and Departure-Time Differentiation in Airline Markets", with Severin Borenstein, *International Journal of Industrial Organization*, 17(5), July 1999, 611-640.

"An Empirical Test of the Effect of Basis Risk on Cash Market Positions", *Journal of Futures Markets*, 16(3), 289-312, May 1996.

"The Effect of Futures Markets and Corners on Storage and Spot Price Variability", *American Journal of Agricultural Economics*, 77(1), 182-193, February 1995.

"Antitrust Policy in Aftermarkets", with Severin Borenstein and Jeffrey K. MacKie-Mason, *Antitrust Law Journal*, 63(2), 455-482, Winter 1995.

"The Economics of Customer Lock-In and Market Power in Services", with Severin Borenstein and Jeffrey K. MacKie-Mason, in *The Service Productivity and Quality Challenge*, Patrick T. Harker, ed., Kluwer Academic, 1994.

Working Papers and Work in Progress

"LCDs and Antitrust: Does Crime Pay?", with Nick Navitski and Josh Palmer, under review

"Fantasy Football Points as a Measure of Performance", with Erin Lane and Juan Nagel

"Non-Profits and Price-Fixing: The Case of the Ivy League"

"The End of Collusion? Competition after Justice and the Ivy League and MIT Settle"

"Basis and Exchange Rate Risks and their Impact on Storage and Exports"

Research Grants

"Cooperation and Competition Among Nonprofits", Nonprofit Sector Research Fund, Aspen Institute, 2000.

"Product Customization and Product-Space Positioning", Dauch Center for the Management of Manufacturing Enterprises, Summer 2000.

"Outstanding Economics Professor of the Year", Economics Club, Purdue University, 1999.

"Trade Barriers, Trade Blocs, Growth, and Convergence", Purdue Research Foundation, 1998-1999.
"Effects of Informational Asymmetry on Competition in the Residential Long Distance Calling Market", Purdue Research Foundation, 1997-1998.

"Basis and Exchange Rate Risks and their Impact on Storage and Exports", Center for International Business and Economic Research, Summer 1997.

Global Initiative Faculty Grant (Course Development), "Industrial Organization in an International Marketplace", Purdue University, Summer 1997.

"Trade, Not Aid", Purdue Research Foundation, Summer 1996.

"Trade, Not Aid", Center for International Business and Economic Research, Summer 1996.

"The Effect of Price-Fixing by Institutions of Higher Education", Purdue Research Foundation, Summer 1995.

"Applied Microeconomics/International Workshop", Purdue University, Spring 1995.

"The Market Structure of Higher Education", University of Delaware, Summer 1993.

Research Associate, Center for the Study of Futures Markets, Columbia University, 1991.

Rackham Merit Fellowship, University of Michigan, 1987-1989.

Chancellor's Scholar, University of California at Berkeley, 1983-1986.

Referee

American Economic Review
Contemporary Economic Policy
Feminist Economics
International Journal of the Economics of Business
International Journal of Industrial Organization
Journal of Economic Education
Journal of Economic and Management Strategy
Journal of Family and Economic Issues
Journal of Futures Markets
Journal of Industrial Economics
Journal of Law and Economics
Journal of Law, Economics, and Organization
Management Science
Review of Economics and Statistics
Scandinavian Journal of Economics
Telecommunications Systems

Conference and Workshop Presentations

Panel participant, “Preparing Early and Often”, State-of-the-Art Strategies for Managing Class Action Experts, American Bar Association, 16th Annual National Institute on Class Actions, Chicago, IL, October 2012.

Panel participant, “Hot Topics Involving Experts in Antitrust Litigation”, New York State Bar Association, Antitrust Law Section, Annual Meeting, New York, NY, January 2011.

Guest lecturer, Alternative Dispute Resolution Practicum, University of Michigan Law School, April 2008.

“The Economics of Indirect Purchaser Cases”, State Bar of Arizona Annual Conference, Phoenix, AZ, June 2004.

“Manipulating Interface Standards as an Anti-Competitive Strategy”, Standards and Public Policy Conference, Federal Reserve Bank of Chicago, Chicago, Il, May 2004.

“One-Way Standards as an Anti-Competitive Strategy”, Telecommunications Policy Research Conference, Alexandria, VA, September 2002.

“Product Proliferation and Product Space Location”, Econometric Society Meetings, New Orleans, January 2001.

“The End of Collusion? Competition after Justice and the Ivy League and MIT Settle”, American Economics Association Meetings, New Orleans, January 2001.

“The End of Collusion? Competition after Justice and the Ivy League and MIT Settle”, Indiana University-Purdue University Indianapolis, November 2000.

“Maximum or Minimum Differentiation? An Empirical Investigation into the Location of Firms”, University of British Columbia, March 2000.

“Non-Profits and Price-Fixing: The Case of the Ivy League”, University of Illinois, October 1999.

“The End of Collusion? Competition after Justice and the Ivy League and MIT Settle”, Baylor University, September 1999.

“The End of Collusion? Competition after Justice and the Ivy League and MIT Settle”, Western Economic Association Meetings, San Diego, July 1999.

“Non-Profits and Price-Fixing: The Case of the Ivy League”, University of Chicago, April 1999.

“Non-Profits and Price-Fixing: The Case of the Ivy League”, Indiana University, December 1998.

“International Integration and Growth: A Survey and Empirical Investigation”, Dynamics, Economic Growth, and International Trade, III, Taiwan, August 1998.

Discussant (“Fiscal Policy and International Demand Spillovers”), Dynamics, Economic Growth, and International Trade, III, An International Conference, Taiwan, August 1998.

“International Integration and Growth”, Workshop on Empirical Research in International Trade and Investment, Copenhagen, June 1998.

Discussant (“Factor Endowments and the Pattern of Affiliate Production by Multinational Enterprises,” by Karolina Ekholm), Workshop on Empirical Research in International Trade and Investment, Copenhagen, June 1998.

"Non-Profits and Price-Fixing: The Case of the Ivy League", Department of Justice Antitrust Division, April 1998.
"Non-Profits and Price-Fixing: The Case of the Ivy League", American Economics Association Meetings, Chicago, January 1998.

Discussant ("Equilibrium under Satisficing," by Ralph W. Pfouts), International Atlantic Economics Society, ASSA Meetings, Chicago, January 1998.

Discussant ("Overseas Investments and Firm Exports," by Keith Head and John Ries), Fourth Annual Empirical Investigations in International Trade conference, Purdue University, November 1997.

"Maximum or Minimum Differentiation? An Empirical Investigation into the Location of Firms", International Atlantic Economic Association Conference, Philadelphia, October 1997.

Discussant ("Antidumping Enforcement in a Reciprocal Model of Dumping: Theory and Evidence," Taiji Furusawa and Thomas J. Prusa) and session chair, Third Annual Empirical Investigations in International Trade conference, Purdue University, November 1996.

"The Effect of Price-Fixing by Institutions of Higher Education", Indiana University-Purdue University Indianapolis, April 1996.

"Exercising Market Power in Proprietary Aftermarkets", with Severin Borenstein and Jeffrey K. MacKie-Mason, Indiana University - Purdue University - IUPUI First Tri-School Conference, March 1996.

"All in the Family: Family, Income, and Labor Force Attachment", with Jon D. Haveman, American Economic Association Meetings, San Francisco, January 1996.

"Family Matters: Unemployment, Wage Changes, and Mobility", with Jon D. Haveman, Southern Economics Association Meetings, New Orleans, November 1995.

Discussant and session chair, Second Annual Empirical Investigations in International Trade conference, Purdue University, November 1995.

"Competition and Anti-Competitive Behavior", ICLE (The State Bar of Michigan) Conference on Antitrust and Intellectual Property, July 1995.

"Price-Fixing, Tuition, and Financial Aid", Midwest Economics Association Meetings, Cincinnati, April 1995.

"Family Matters: Unemployment, Wage Changes, and Mobility," Midwest Economics Association Meetings, Cincinnati, April 1995.

Discussant and session chair, "Customer Discrimination, Entrepreneurial Decisions, and Investment", Midwest Economics Association Meetings, April 1995.

"An Empirical Test of the Effect of Basis Risk on Cash Market Positions", University of Illinois, Urbana-Champaign, February 1995.

Discussant and session chair, First Annual Empirical Investigations in International Trade conference, Purdue University, November 1994.

"Antitrust Policy in Aftermarkets", with Severin Borenstein and Jeffrey K. MacKie-Mason, FTC/DOJ/ABA Conference on Post-Chicago Economics, Washington, D.C., May 1994.

"The Effect of Price-Fixing by Institutions of Higher Education, University of Delaware, May 1994.

"The Effect of Futures Markets and Corners on Storage and Spot Price Variability", Purdue University, February 1994.

"An Empirical Test of the Effect of Basis Risk on Cash Market Positions", University of California at Davis, February 1993.

Discussant, Econometrics Association, Anaheim, 1992 Annual Meetings.

"Testing the Principle of Minimum Differentiation: Airline Departure-Time Crowding", Econometrics Association, Washington, D.C., 1990 Annual Meetings.

Consulting and Testifying

In re Cathode Ray Tube (CRT) Antitrust Litigation
United States District Court, Northern District of California, San Francisco Division, No. CV-07-5944-SC
Testifying expert for plaintiffs
Deposed November 2012 and March 2013

In re Photochromic Lens Antitrust Litigation, 2010-2012
United States District Court Middle District of Florida, Tampa Division, No. 8:10-md-02173-JDW-EAJ
Testifying expert for plaintiffs
Deposed August 2012

Datel Holdings and Datel Design and Development v. Microsoft, 2010-2011
United States District Court, Northern District of California, San Francisco Division, No. 09-cv-05535
Testifying expert for plaintiffs
Deposed October 2011

In re Prefilled Propane Tank Marketing and Sales Practices Litigation, 2010-2011
United States District Court, Western District of Missouri, Western Division, No. 4:09-cv-00465
Testifying expert for plaintiffs

In re Florida Cement and Concrete Antitrust Litigation, 2010
United States District Court, Southern District of Florida, Miami Division, No. 1:09-cv-23493-CMA
Consulting expert for plaintiffs

Altair Engineering v. MSC Software, 2009-2010
United States District Court, Eastern District of Michigan, Southern Division, No. 2:07-cv-12807
Testifying expert for plaintiffs
Deposed May 2010

In re Optical Disk Drive products Antitrust Litigation, 2009-2010
United States District Court, Northern District of California, San Francisco Division, No. M:2010-cv-02143
Consulting expert for plaintiffs

In re Flash Memory Antitrust Litigation, 2008-2011
United States District Court, Northern District of California, Oakland Division, No. C-07-0086-SBA
Testifying expert for plaintiffs
Deposed August 2009

Valassis Communications, Inc. v. News America, Inc., 2008-2009
United States District Court, Eastern District of Michigan, Southern Division, No. 2:06-cv-10240
Circuit Court of the State of Michigan, County of Wayne, No. 07-0706645-CZ
Consulting expert for plaintiffs

In re TFT-LCD (Flat Panel) Antitrust Litigation, 2008-present
United States District Court, Northern District of California, San Francisco Division, No. M:07-cv-01827
Testifying expert for plaintiffs
Deposed July 2009, June 2011, August 2011

Houston Baptist University v. NCAA, 2008-2009
United States District Court in and for the Southern District of Texas, Houston Division
Testifying expert for plaintiffs

Seoul Semiconductor Co. v. Nichia Corp., 2008
United States District Court, Northern District of California, No. 3:08-cv-04932-PJH
Testifying expert for plaintiffs

Albert Andy Cohn v. Office Depot, 2008
Superior Court of the State of California, County of Los Angeles, Central District, No. BC 372449
Testifying expert for defendants

In re Graphics Processing Units Antitrust Litigation, 2007-2008
United States District Court Northern District of California, No. M:07-CV-01826-WHA
Testifying expert for plaintiffs
Deposed June 2008

Pro-Sys Consultants Ltd. and Neil Godfrey v. Microsoft, 2007-present
Supreme Court of British Columbia, No. L043175, Vancouver Registry
Testifying expert for plaintiffs
Deposed December 2008

In re Dynamic Random Access Memory (DRAM) Antitrust Litigation, 2007
United States District Court, Northern District of California, No. 02-cv-01486
Consulting expert for plaintiffs

Jason White et al. v. NCAA, 2006-2008
United States District Court Central District of California, No. CV 06-0999 RGK (MANx)
Testifying expert for plaintiffs
Deposed October 2007

Kleppner et al. v. Unocal, 2004-2008
In re Reformulated Gasoline (RFG) Antitrust and Patent Litigation
United States District Court Central District of California, No. 05-1671 CAS
Testifying expert for plaintiffs
Deposed December 2006

Carlisle, settlement negotiations with Crompton, EPDM price-fixing cartel, 2005-2007
Consulting expert

Caterpillar and Carlisle, settlement negotiations with DuPont-Dow Elastomers, PCP (or CR) and EPDM price-fixing cartels, 2004-2005
Consulting expert

City and County of San Francisco et al. v. Microsoft, 2004-present
United States District Court for the District of Maryland, No. 1332
Testifying expert for plaintiffs

The Service Source v. Office Depot, 2004-2005
United States District Court Eastern District of Michigan Southern Division, No. 02-73361
Project director

Joe Comes et al. v. Microsoft, 2002-2008
Iowa District Court for Polk County, No. CL82311
Testifying expert for plaintiffs
Deposed July 2006, November 2006

Charles Cox et al. v. Microsoft, 2002-2006
Supreme Court of the State of New York County of New York, No. 105193/00
Testifying expert for plaintiffs

Daniel Gordon et al. v. Microsoft, 2002-2004
State of Minnesota District Court County of Hennepin Fourth Judicial District, No. 00-5994
Testifying expert for plaintiffs
Deposed September 2003

Morelock Enterprises, Inc. v. Weyerhaeuser Co., 2004-2008
United States District Court District of Oregon, No. 3:04-cv-00583-PA
Testifying expert for plaintiffs
Deposed October 2004, April 2005, October 2007
Testified in trial April 2008

Compuware v. IBM, 2002-2005
United States District Court for the Eastern District of Michigan, No. 02-70906
Project director

Lingo et al. v. Microsoft, 1999-2004
Superior Court of the State of California City and County of San Francisco, J.C.C.P. No. 4106
Project director
In re New Mexico Indirect Purchaser Microsoft Corp. Antitrust Litigation, 2002-2004
State of New Mexico First Judicial District, No. D-0101-CV-2000-1697
Testifying expert for plaintiffs

Charles Friedman et al. v. Microsoft, 2002-2004
Superior Court of the State of Arizona in and for the County of Maricopa, No. CV2000-000722 / CV2000-005872
Testifying expert for plaintiffs
Deposed September 2003

In re Massachusetts Consumer Protection Litigation, 2003-2004
Commonwealth of Massachusetts, Superior Court Department of the Trial Court Middlesex Division, No. 00-2456
Consulting expert

Olson v. Microsoft, 2002
Montana First Judicial District Court Lewis & Clark County, No. CDV-2000-219
Consulting expert

Covad v. Bell Atlantic (Verizon), 2001-2004
United District Court for the District of Columbia, No. 99-1046
Project director

AMD, 2000-2004
Project director

Gravity et al. v. Microsoft, 1999-2003
United States District Court for the District of Columbia, No. 1:99CV00363
Staff economist

Leckrone, et al. v. Premark International, Inc., et al., 2001
Testifying expert for plaintiffs

Ren, et al. v. EMI Music Distribution, Inc., 2001
State of Michigan in the Circuit Court of the County of Macomb, No. 00-2383-CZ
Testifying expert for plaintiffs

SBC, 2000
Staff economist

City and County of San Francisco, 1999
Staff economist

Intergraph v. Intel, 1998-2001
United States District Court Appeals for the Federal District, No. 98-1308
Staff economist

Comm-Tract v. Northern Telecom, 1991-1997
United States District Court District of Massachusetts, No. 90-13088-WF
Project director

Systemcare, Inc. v. Wang Computer, 1991-1993
United States District Court for the District of Colorado, No. 89-B-1778
Staff economist

International Travel Arrangers v. Northwest Airlines, 1988-1989
Staff economist

Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

AMZ 00001
BBYCRT000080
BBYCRT000081
BBYCRT000082
BBYCRT000083
BBYCRT000084
BBYCRT000085
BBYCRT000086
BBYCRT000087
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BMCC-CRT000134306
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BMCC-CRT000178816
BMCC-CRT000178829
BMCC-CRT000230941
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BMCC-CRT000240214
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BMCC-CRT000371371
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BMCC-CRT000510774
BMCC-CRT000548051
BMCC-CRT000562015
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BMCC-CRT000595208
BMCC-CRT000595907
CH000028606
CH000030816

Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

CHU00000001
CHU00000207
CHU00000260
CHU00000305
CHU00000360
CHU00000411
CHU00000532
CHU00000642
CHU00000688
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CHU00000738
CHU00000782
CHU00000828
CHU00000875
CHU00001031
CHU00001275
CHU00001348
CHU00001427
CHU00003139
CHU00004334
CHU00005963
CHU00005997
CHU00006004
CHU00006009
CHU00006009
CHU00006362
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Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

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Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

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Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

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Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

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Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

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Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

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Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

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Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

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Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

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Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

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Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

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Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

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Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

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Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

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Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

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Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

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Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

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SDCRT-0005856
SDCRT-0005874

Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

SDCRT-0005888
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SDCRT-0005929
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SDCRT-0033489
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Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

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SDCRT-0042754
SDCRT-0045335
SDCRT-0045335P-0001
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SDCRT-0083119.1
SDCRT-0083119.2
SDCRT-0084985
SDCRT-0085141
SDCRT-0085394
SDCRT-0085535
SDCRT-0086208

Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

SDCRT-0086211
SDCRT-0086217
SDCRT-0086221
SDCRT-0086224
SDCRT-0086230
SDCRT-0086238
SDCRT-0086245
SDCRT-0086247
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Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

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Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

SDCRT-0091505
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SDCRT-0091531
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SDCRT-0215903
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SDCRT-0216554
SDOC0483
SEAI-00342506
SEAI-CRT-00000042
SEAI-CRT-00000052
SEAI-CRT-00000056
SEAI-CRT-00000122
SEAI-CRT-00000163
SEAI-CRT-00000312

Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

SEAI-CRT-00003951
SEAI-CRT-00025857
SEAI-CRT-00035855
SEAI-CRT-00042508
SEAI-CRT-00042833
SEAI-CRT-00050544
SEAI-CRT-00051749
SEAI-CRT-00059368
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SEAI-CRT-00079762
SEAI-CRT-00079762
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SEAI-CRT-00112061
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SEAI-CRT-00178170
SEAI-CRT-00183467
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SEAI-CRT-00207850
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SEAI-CRT-00295237
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SEAl-CRT-00342235
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SEAR_CRT00000015
SEAR_CRT00000016
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SEAR_CRT00000018
SEAR_CRT00000019
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SEAR_CRT00000021
SEAR_CRT00000022
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SEC-CRT-00000018
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SEC-CRT-00018388
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TAEC-CRT-00014236
TAEC-CRT-00016370
TAEC-CRT-00016371
TAEC-CRT-00016372
TAEC-CRT-00016373
TAEC-CRT-00018123

Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

TAEC-CRT-00020718
TAEC-CRT-00021577
TAEC-CRT-00023685
TAEC-CRT-00025345
TAEC-CRT-00026960
TAEC-CRT-00038135
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TDCRT-0000023
TDCRT-0000024

Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

TDCRT-0000025
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TDCRT-0000027
TDCRT-0000028
TDCRT-0000029
TET-CRT-00001249
TET-CRT-00002363
TET-CRT-00002488
TET-CRT-00002612
TET-CRT-00002966
TET-CRT-00003403
TSB-CR T-00041870
TSB-CRT-00007596
TSB-CRT-00008017
TSB-CRT-00008068
TSB-CRT-00009873
TSB-CRT-00009883
TSB-CRT-00009884
TSB-CRT-00009885
TSB-CRT-00018162
TSB-CRT-00018808
TSB-CRT-00018869
TSB-CRT-00025664
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TSB-CRT-00061314
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TSB-CRT-00061316
TSB-CRT-00061317
TSB-CRT-00061661
TSB-CRT-00062406
TSR-CRT-00041633
TUSCRTP000001320
TUSCRTP00001224
VIEW_CRT00000001
VIEW_CRT00000002
VIEW_CRT00000003
VIEW_CRT00000004
WM2009-58914C000001
WM2009-58914C000019
WM2009-58914C000020
WM2009-58914C000190
WM2009-58914C000202
WM2009-58914C000213
WM2009-58914C000288
WM2009-58914C000329
WM2009-58914C000457
WM2009-58914C000475
WM2009-58914C001040
WM2009-58914C001437
WM2009-58914C001515
WM2009-58914C002250
WM2009-58914C002436
WM2009-58914C002726
WM2009-58914C002877
WM2009-58914C003124
WM2009-58914C003132
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WM2009-58914C003176
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WM2009-58914C003207
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WM2009-58914C003223
WM2009-58914C003289
WM2009-58914C003537
WM2009-58914C003643
WM2009-58914C004257
WM2009-58914C004713
WM2009-58914C004749
WM2009-58914C005826
WM2009-58914C006103
WM2009-58914C007350

Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 1: Bates Numbered Documents

WM2009-58914C007366

WM2009-58914C007380

WM2009-58914C007436

ZENCRT000001

ZENCRT000044

ZENCRT42-HC

ZENCRT43-HC

Exhibit B: Documents Considered in the Expert Report of Expert Report of Janet S. Netz, Ph.D. Part 2: Confidential Documents without Bates Numbers

01 August 2012, Deposition of Philips Electronics North America Corporation, Inc. and Koninklijke Philips Electronics N.V. 30(b)(6) Witness Roger De Moor.

01 August 2012, Deposition of Toshiba America Consumer Products and Toshiba America Information Systems 30(b)(6) Witness Richard Eugene Huber.

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27 September 2013, Deposition of Shinichiro Tsuruta, Volume III.

28 February 2013, Deposition of Jing Song Lu, Volume II.

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Production Lines, by Type

Type	Total
CPT Only	186
CDT Only	89
Switched	33
Hybrid	7
Hybrid-Switch	7

Type	Maker	Country	Site	Line
CPT Only	Baoma	China	Changzhou	#1
CPT Only	BDDL	India	New Delhi	#1
CPT Only	Chunghwa	United Kingdom	Mossend	#1
CPT Only	Chunghwa	Malaysia	Selangor	#1
CPT Only	Chunghwa	Malaysia	Selangor	#3
CPT Only	Chunghwa	Malaysia	Selangor	#4
CPT Only	Ekranas	Lithuania	Panevezys	#1
CPT Only	Ekranas	Lithuania	Panevezys	#2
CPT Only	Ekranas	Lithuania	Panevezys	#3
CPT Only	Ekranas	Lithuania	Panevezys	#4
CPT Only	Hitachi	United States	Greenville	#1
CPT Only	Hitachi	United States	Greenville	#2
CPT Only	Hitachi	Japan	Mobara	#4
CPT Only	Hitachi	Japan	Sakura	#1
CPT Only	Hitachi	China	Shenzhen	#1
CPT Only	Hitachi	China	Shenzhen	#2
CPT Only	Hitachi	China	Shenzhen	#3
CPT Only	Hitachi	China	Shenzhen	#4
CPT Only	Hotline	India	Gwalior	#1
CPT Only	Hotline	India	Gwalior	#2
CPT Only	Hotline	India	Gwalior	#3
CPT Only	Irico	China	Xianyang	#1
CPT Only	Irico	China	Xianyang	#3
CPT Only	Irico	China	Xianyang	#4
CPT Only	Irico	China	Xianyang	#5
CPT Only	Irico	China	Xianyang	#7
CPT Only	Irico	China	Xianyang	#8
CPT Only	JCT	India	Chandigarh	#1
CPT Only	JCT	India	Chandigarh	#2
CPT Only	JCT	India	Vadadora	#1
CPT Only	JCT	India	Vadadora	#2
CPT Only	LPD	Germany	Aachen	#1
CPT Only	LPD	Germany	Aachen	#2
CPT Only	LPD	Germany	Aachen	#3
CPT Only	LPD	Spain	Barcelona	#1
CPT Only	LPD	Spain	Barcelona	#2
CPT Only	LPD	Spain	Barcelona	#3
CPT Only	LPD	China	Changsa	#1
CPT Only	LPD	China	Changsa	#2

Type	Maker	Country	Site	Line
CPT Only	LPD	China	Changsa	#3
CPT Only	LPD	Korea	Changwon	H-1
CPT Only	LPD	France	Dreux	#1
CPT Only	LPD	France	Dreux	#2
CPT Only	LPD	France	Dreux	#3
CPT Only	LPD	United Kingdom	Durham	#1
CPT Only	LPD	United Kingdom	Durham	#2
CPT Only	LPD	United Kingdom	Durham	#3
CPT Only	LPD	Mexico	Gomez (Moved From Ottawa)	A
CPT Only	LPD	Mexico	Gomez (Moved From Ottawa)	B/C
CPT Only	LPD	Mexico	Gomez (Moved From Ottawa)	D (D/C)
CPT Only	LPD	Indonesia	Jakarta	#1
CPT Only	LPD	Indonesia	Jakarta	#2
CPT Only	LPD	Korea	Kumi	A
CPT Only	LPD	Korea	Kumi	J
CPT Only	LPD	Korea	Kumi	P
CPT Only	LPD	Korea	Kumi	W
CPT Only	LPD	India	Malanpur	#1
CPT Only	LPD	China	Nanjing	PL1
CPT Only	LPD	China	Nanjing	PL2
CPT Only	LPD	China	Nanjing	PL3
CPT Only	LPD	China	Nanjing	PL4
CPT Only	LPD	China	Nanjing	PL5
CPT Only	LPD	United States	Ottawa	#1
CPT Only	LPD	United States	Ottawa	#2
CPT Only	LPD	United States	Ottawa	#3
CPT Only	LPD	United States	Ottawa	#4
CPT Only	LPD	United States	Ottawa	#5
CPT Only	LPD	United States	Ottawa	#6
CPT Only	LPD	United States	Rauland	#1
CPT Only	LPD	United States	Rauland	#4
CPT Only	LPD	Brazil	Sao Jose Dos Campos	#1
CPT Only	LPD	Brazil	Sao Jose Dos Campos	#2
CPT Only	LPD	Brazil	Sao Jose Dos Campos	#3
CPT Only	LPD	Brazil	Sao Jose Dos Campos	#4
CPT Only	LPD	Brazil	Sao Jose Dos Campos	#6
CPT Only	Mitsubishi	Japan	Kyoto	#1
CPT Only	Mitsubishi	Japan	Kyoto	#2
CPT Only	Mitsubishi	Japan	Kyoto	#3
CPT Only	MTPD	Thailand	Bang Kadi	#2
CPT Only	MTPD	Thailand	Bang Kadi	#6
CPT Only	MTPD	China	Beijing	#3
CPT Only	MTPD	China	Beijing	#4
CPT Only	MTPD	China	Beijing	#5
CPT Only	MTPD	Germany	Esslingen	#1
CPT Only	MTPD	Germany	Esslingen	#2
CPT Only	MTPD	Japan	Fukaya	#3
CPT Only	MTPD	Japan	Himeji	#2

Type	Maker	Country	Site	Line
CPT Only	MTPD	Japan	Himeji	#3
CPT Only	MTPD	United States	Horseheads	#1
CPT Only	MTPD	Indonesia	Jakarta	#1
CPT Only	MTPD	Indonesia	Jakarta	#2
CPT Only	MTPD	Japan	Kiyohara	#1
CPT Only	MTPD	Malaysia	Selangor	#1
CPT Only	MTPD	Malaysia	Selangor	#3
CPT Only	MTPD	Malaysia	Selangor	#5
CPT Only	MTPD	Malaysia	Selangor	#6
CPT Only	MTPD	Japan	Takatsuki	#2
CPT Only	MTPD	United States	Troy	#1
CPT Only	MTPD	United States	Troy	#2
CPT Only	MTPD	United States	Troy	#3
CPT Only	MTPD	United States	Troy	#4
CPT Only	MTPD	Japan	Utsunomiya	#1
CPT Only	Multi-Displays	Czech Republic	Hranice	#1
CPT Only	Multi-Displays	Czech Republic	Hranice	#2
CPT Only	Multi-Displays	Czech Republic	Hranice	#3
CPT Only	Novel	China	Shanghai	#1
CPT Only	Novel	China	Shanghai	#2
CPT Only	Novel	China	Shanghai	#3
CPT Only	Novel	China	Shanghai	#4
CPT Only	Novel	China	Shanghai	#5
CPT Only	Orion	Vietnam	Hanoi	#1
CPT Only	Orion	Vietnam	Hanoi	#2
CPT Only	Orion	Korea	Kumi	#1(ORICO-8)
CPT Only	Orion	Korea	Kumi	#2(ORICO-11)
CPT Only	Orion	Korea	Kumi	BSC
CPT Only	Orion	Korea	Kumi	BSF
CPT Only	Orion	Korea	Kumi	BSL
CPT Only	Orion	France	Longwy	#1
CPT Only	Orion	Mexico	Mexicali	#1
CPT Only	Rct	Brazil	Sao Paulo	#1
CPT Only	Samtel	India	Ghaziabad	#1
CPT Only	Samtel	India	Ghaziabad	#2
CPT Only	Samtel	India	Ghaziabad	#4
CPT Only	Samtel	India	Kota	#5
CPT Only	SDI	Germany	Berlin	#1
CPT Only	SDI	Germany	Berlin	#2
CPT Only	SDI	Korea	Busan	#7
CPT Only	SDI	Korea	Busan	#8
CPT Only	SDI	Hungary	Hungary	#1
CPT Only	SDI	Hungary	Hungary	#2
CPT Only	SDI	Malaysia	Sembilan	#1
CPT Only	SDI	Malaysia	Sembilan	#2
CPT Only	SDI	Malaysia	Sembilan	#3
CPT Only	SDI	China	Shenzhen	#1
CPT Only	SDI	Korea	Suwon	#6

Type	Maker	Country	Site	Line
CPT Only	SDI	China	Tianjin	#1
CPT Only	SDI	China	Tianjin	#3
CPT Only	SDI	Mexico	Tijuana	#1
CPT Only	SDI	Mexico	Tijuana	#2
CPT Only	Sony	United Kingdom	Bridgend	#1
CPT Only	Sony	United Kingdom	Bridgend	#2
CPT Only	Sony	United Kingdom	Bridgend	#3
CPT Only	Sony	Japan	Inazawa	#5
CPT Only	Sony	Japan	Mizunami	#2
CPT Only	Sony	United States	Pittsburgh	#1
CPT Only	Sony	United States	Pittsburgh	#2
CPT Only	Sony	United States	San Diego	#1
CPT Only	Sony	United States	San Diego	#2
CPT Only	Sony	United States	San Diego	#3
CPT Only	Sony	China	Shanghai	#1
CPT Only	Sony	China	Shanghai	#3
CPT Only	Sony	Singapore	Tuas	#2
CPT Only	Sony	Singapore	Tuas	#3
CPT Only	Tesla	Czech Republic	Roznov	#1
CPT Only	Tesla	Czech Republic	Roznov	#2
CPT Only	Thai-CRT	Thailand	Chonburi	#1
CPT Only	Thai-CRT	Thailand	Chonburi	#2
CPT Only	Thai-CRT	Thailand	Chonburi	#3
CPT Only	Thai-CRT	Thailand	Chonburi	#4
CPT Only	Thomson	United States	Marion	#1
CPT Only	Thomson	United States	Marion	#2
CPT Only	Thomson	United States	Marion	#3
CPT Only	Thomson	United States	Marion	#4
CPT Only	Thomson	United States	Marion	#5
CPT Only	Thomson	Mexico	Mexico City	#1
CPT Only	Thomson	United States	Scranton	#1
CPT Only	Thomson	United States	Scranton	#2
CPT Only	Videocon	Italy	Anagni	#1
CPT Only	Videocon	Italy	Anagni	#2
CPT Only	Videocon	Italy	Anagni	#3
CPT Only	Videocon	Italy	Anagni	#4
CPT Only	Videocon	China	Dongguan	#1
CPT Only	Videocon	China	Dongguan	#2
CPT Only	Videocon	China	Dongguan	#3
CPT Only	Videocon	China	Foshan	#1
CPT Only	Videocon	China	Foshan	#2
CPT Only	Videocon	United States	Marion	#1
CPT Only	Videocon	United States	Marion	#2
CPT Only	Videocon	United States	Marion	#3
CPT Only	Videocon	United States	Marion	#4
CPT Only	Videocon	United States	Marion	#5
CPT Only	Videocon	Mexico	Mexicali	#1
CPT Only	Videocon	Mexico	Mexicali	#2

Type	Maker	Country	Site	Line
CPT Only	Videocon	Poland	Piaseczno	#1
CPT Only	Videocon	Poland	Piaseczno	#2
CPT Only	Videocon	Poland	Piaseczno	#3
CDT Only	Chunghwa	China	Fuzhou	#1
CDT Only	Chunghwa	China	Fuzhou	#2
CDT Only	Chunghwa	China	Fuzhou	#5
CDT Only	Chunghwa	China	Fuzhou	#6
CDT Only	Chunghwa	China	Fuzhou	#7
CDT Only	Chunghwa	China	Fuzhou	#8
CDT Only	Chunghwa	Taiwan	Taoyuan	#1
CDT Only	Chunghwa	Taiwan	Taoyuan	#2
CDT Only	Chunghwa	Taiwan	Taoyuan	#3
CDT Only	Chunghwa	Taiwan	Taoyuan	#4
CDT Only	Chunghwa	Taiwan	Yangmei	#1
CDT Only	Chunghwa	Taiwan	Yangmei	#2
CDT Only	Chunghwa	Taiwan	Yangmei	#3
CDT Only	Chunghwa	Taiwan	Yangmei	#4
CDT Only	Hitachi	Malaysia	Malaysia	#6
CDT Only	Hitachi	Japan	Mobara	#1
CDT Only	Hitachi	Japan	Mobara	#2
CDT Only	Hitachi	Japan	Mobara	#3
CDT Only	Hitachi	Japan	Sakura	#2
CDT Only	Hitachi	Japan	Sakura	#3
CDT Only	Hitachi	Japan	Sakura	#4
CDT Only	Hitachi	Japan	Sakura	#5
CDT Only	Hitachi	Singapore	Singapore	#1
CDT Only	Hitachi	Singapore	Singapore	#2
CDT Only	Hitachi	Singapore	Singapore	#3
CDT Only	Hitachi	Singapore	Singapore	#4
CDT Only	Hitachi	Singapore	Singapore	#5
CDT Only	LPD	China	Changsa	#4
CDT Only	LPD	Korea	Changwon	H-3
CDT Only	LPD	Taiwan	Chupei	#1
CDT Only	LPD	Taiwan	Chupei	#2
CDT Only	LPD	Taiwan	Chupei	#3
CDT Only	LPD	Taiwan	Chupei	#4
CDT Only	LPD	Taiwan	Chupei	#5
CDT Only	LPD	Taiwan	Dapon	#1
CDT Only	LPD	Taiwan	Dapon	#2
CDT Only	LPD	Taiwan	Dapon	#3
CDT Only	LPD	Taiwan	Dapon	#4
CDT Only	LPD	Taiwan	Dapon	#5
CDT Only	LPD	Korea	Kumi	F-2
CDT Only	LPD	Korea	Kumi	G-1
CDT Only	LPD	Korea	Kumi	G-2
CDT Only	LPD	Korea	Kumi	T
CDT Only	LPD	Austria	Lebring	#1
CDT Only	LPD	Austria	Lebring	#2

Type	Maker	Country	Site	Line
CDT Only	LPD	Austria	Lebring	#3
CDT Only	LPD	Austria	Lebring	#4
CDT Only	LPD	China	Nanjing	DL3
CDT Only	LPD	China	Nanjing	DL4
CDT Only	LPD	China	Nanjing	DL5
CDT Only	LPD	China	Nanjing	DL6
CDT Only	LPD	China	Nanjing	DL7
CDT Only	LPD	United Kingdom	Wales	#1
CDT Only	Mitsubishi	Japan	Kyoto	#5
CDT Only	Mitsubishi	Japan	Kyoto	#6
CDT Only	Mitsubishi	Japan	Kyoto	#7
CDT Only	Mitsubishi	Mexico	Mexicali	#1
CDT Only	MTPD	Thailand	Bang Kadi	#4
CDT Only	MTPD	Japan	Fukaya	#1
CDT Only	MTPD	Japan	Fukaya	#2
CDT Only	MTPD	Japan	Himeji	#1
CDT Only	MTPD	Japan	Kiyohara	#2
CDT Only	MTPD	Malaysia	Selangor	#4
CDT Only	MTPD	Japan	Takatsuki	#1
CDT Only	MTPD	Japan	Utsunomiya	#3
CDT Only	Nec	Japan	Otsu	#1
CDT Only	Nec	Japan	Otsu	#2
CDT Only	Orion	Korea	Kumi	#4(ORICO-9)
CDT Only	Orion	Korea	Kumi	#5(ORICO-10)
CDT Only	Orion	Korea	Kumi	BSA
CDT Only	Orion	Mexico	Mexicali	#2
CDT Only	SDI	Korea	Busan	#3
CDT Only	SDI	Korea	Busan	#6
CDT Only	SDI	China	Shenzhen	#2
CDT Only	SDI	Korea	Suwon	#2
CDT Only	SDI	Korea	Suwon	#3
CDT Only	SDI	Korea	Suwon	#4
CDT Only	SDI	Korea	Suwon	#5
CDT Only	SDI	China	Tianjin	#2
CDT Only	Sony	Japan	Inazawa	#1
CDT Only	Sony	Japan	Inazawa	#2
CDT Only	Sony	Japan	Inazawa	#3
CDT Only	Sony	Japan	Inazawa	#4
CDT Only	Sony	Japan	Inazawa	#6
CDT Only	Sony	Japan	Mizunami	#1
CDT Only	Sony	Japan	Mizunami	#4
CDT Only	Sony	United States	San Diego	#4
CDT Only	Sony	Singapore	Tuas	#4
CDT Only	TECO	Taiwan	Kguanin	#1
Switched	Chunghwa	China	Fuzhou	#3
Switched	Chunghwa	China	Fuzhou	#4
Switched	Chunghwa	United Kingdom	Mossend	#2
Switched	Chunghwa	Malaysia	Selangor	#2

Type	Maker	Country	Site	Line
Switched	Chunghwa	Malaysia	Selangor	#5
Switched	Chunghwa	Malaysia	Selangor	#6
Switched	Chunghwa	Malaysia	Selangor	#7
Switched	Chunghwa	Malaysia	Selangor	#8
Switched	Irico	China	Xianyang	#2
Switched	Irico	China	Xianyang	#6
Switched	LPD	China	Changsa	#5
Switched	LPD	Korea	Kumi	F-1
Switched	LPD	China	Nanjing	DL1
Switched	LPD	China	Nanjing	DL2
Switched	LPD	United States	Rauland	#2
Switched	LPD	United States	Rauland	#3
Switched	LPD	Brazil	Sao Jose Dos Campos	#5
Switched	Mitsubishi	Japan	Kyoto	#4
Switched	MTPD	Thailand	Bang Kadi	#1
Switched	MTPD	Thailand	Bang Kadi	#3
Switched	MTPD	China	Beijing	#1
Switched	MTPD	China	Beijing	#6
Switched	MTPD	Malaysia	Selangor	#2
Switched	Orion	Korea	Kumi	#3(ORICO-7)
Switched	Samtel	India	Ghaziabad	#3
Switched	SDI	Korea	Busan	#2
Switched	SDI	Korea	Busan	#4
Switched	SDI	Korea	Busan	#5
Switched	SDI	Malaysia	Sembilan	#6
Switched	SDI	China	Shenzhen	#4
Switched	Sony	China	Shanghai	#2
Switched	Sony	Singapore	Tuas	#1
Switched	Thai-CRT	Thailand	Rayong	#5
Hybrid	MTPD	China	Beijing	#2
Hybrid	MTPD	United States	Horseheads	#2
Hybrid	MTPD	Japan	Utsunomiya	#2
Hybrid	SDI	Korea	Busan	#1
Hybrid	SDI	Brazil	Manaus	#1
Hybrid	SDI	Brazil	Manaus	#2
Hybrid	Sony	Japan	Mizunami	#3
Hybrid-Switch	LPD	Korea	Changwon	H-2
Hybrid-Switch	LPD	Korea	Changwon	H-5
Hybrid-Switch	LPD	United Kingdom	Wales	#2
Hybrid-Switch	SDI	Malaysia	Sembilan	#4
Hybrid-Switch	SDI	Malaysia	Sembilan	#5
Hybrid-Switch	SDI	China	Shenzhen	#3
Hybrid-Switch	SDI	Korea	Suwon	#1

Note(s):

Lines that exhibited positive CPT and CDT capacity simultaneously on at least two distinct dates in each of at least two distinct years are considered to have sufficient observations to be considered a “hybrid” line. E.g., a line with positive CPT and CDT capacity on two different dates within 2003 and two different dates in 2004 would be considered a hybrid line, whereas a line with only one hybrid observation in each year would not. “Hybrid-switch” lines are lines that satisfy our criteria for a “hybrid” line, but also contain observations in which they produce both CPTs exclusively and CDTs exclusively. Samsung’s Suwon #1 line is among the 14 lines I classify as “hybrid” or “hybrid-switch”.

Source File(s):

line_list_by_type.do

line_type.do

Capacity Worksheets.xlsx

capacity_database.do

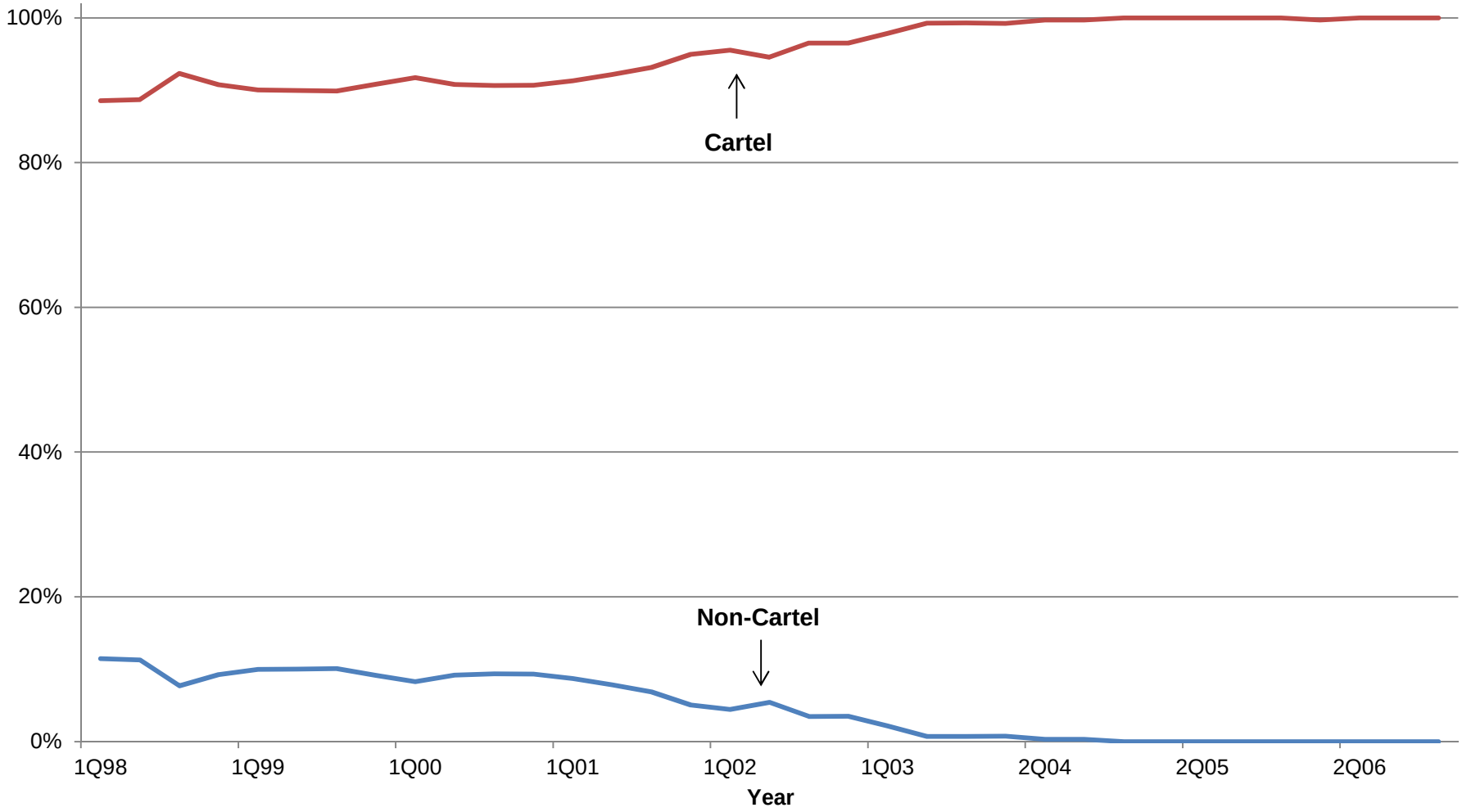
database edits.do

early_capacity_load.do

capacity_load.do

line_list_by_type.xlsx

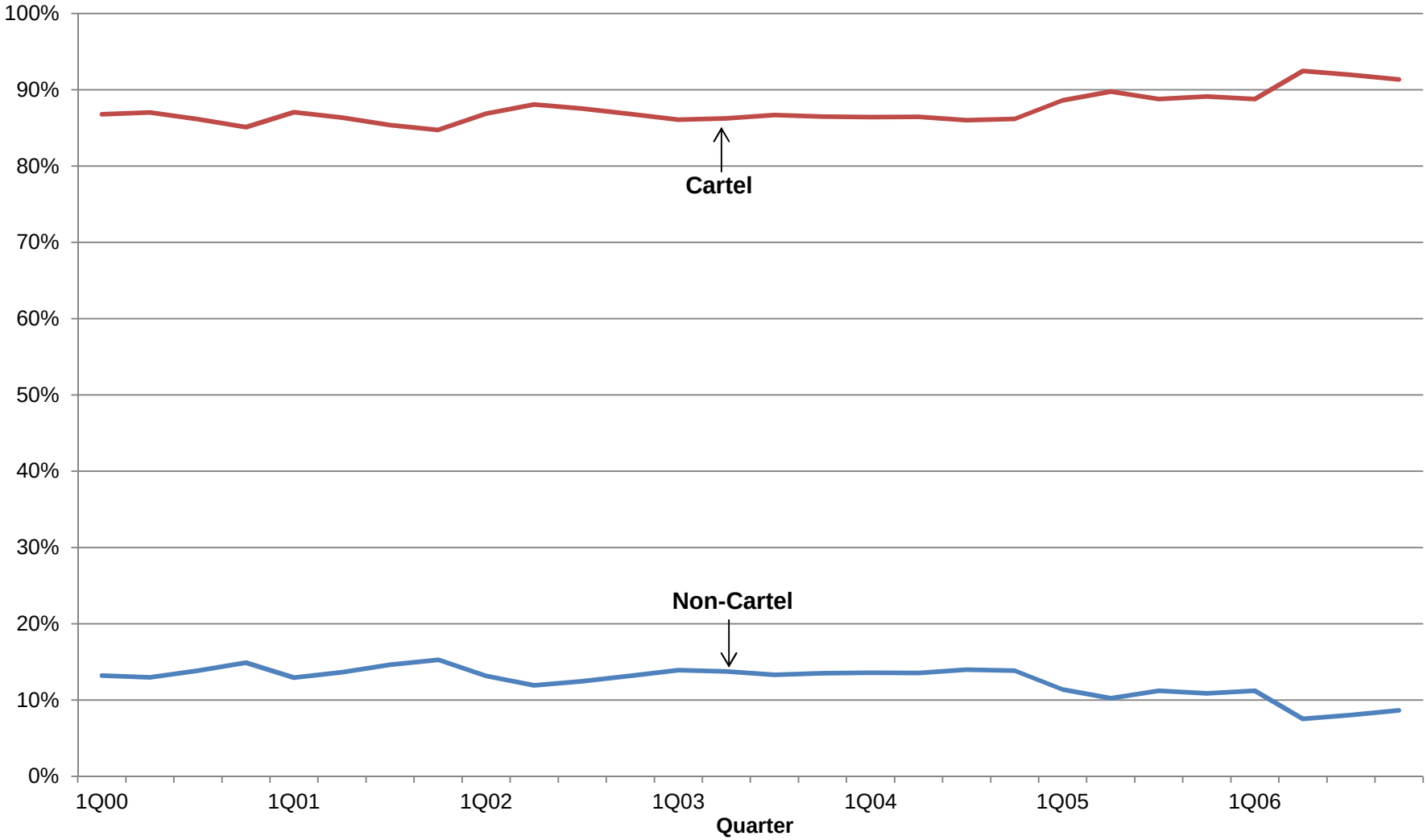
Worldwide CDT Production Shares



Note(s): 4Q03 CDT data are comprised of DisplaySearch projected quantities. There are no CDT market share data for 1Q04. "Others" CDT manufacturer assumed to be Orion in 3Q05 - 4Q06 based on CDT capacity information.
Data Source(s): See Exhibits 2 and 82.
Source File(s): CDT share.do, dta creator.do; Clean Shares.xlsx

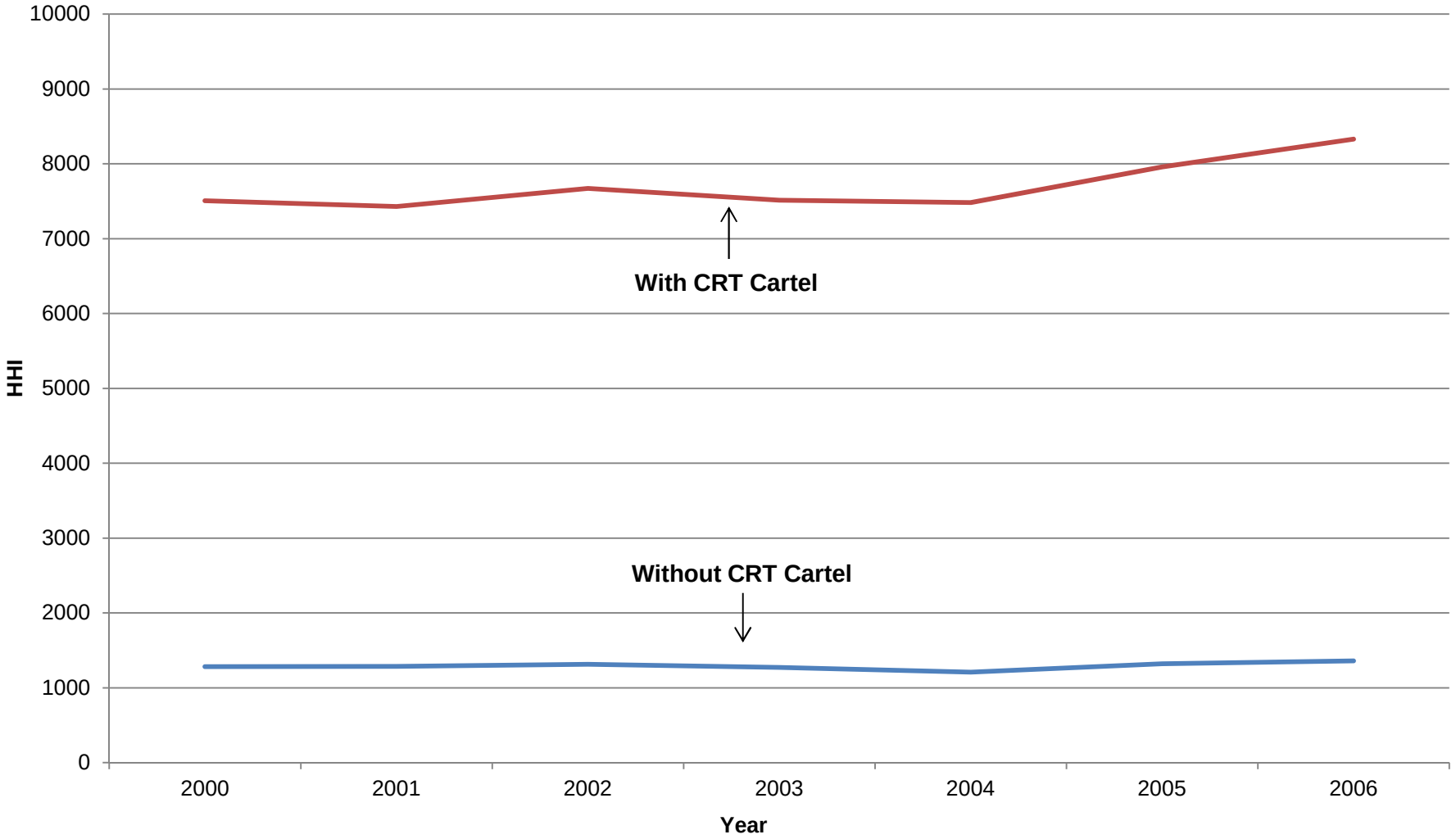
Exhibit 4

Worldwide CPT Production Shares



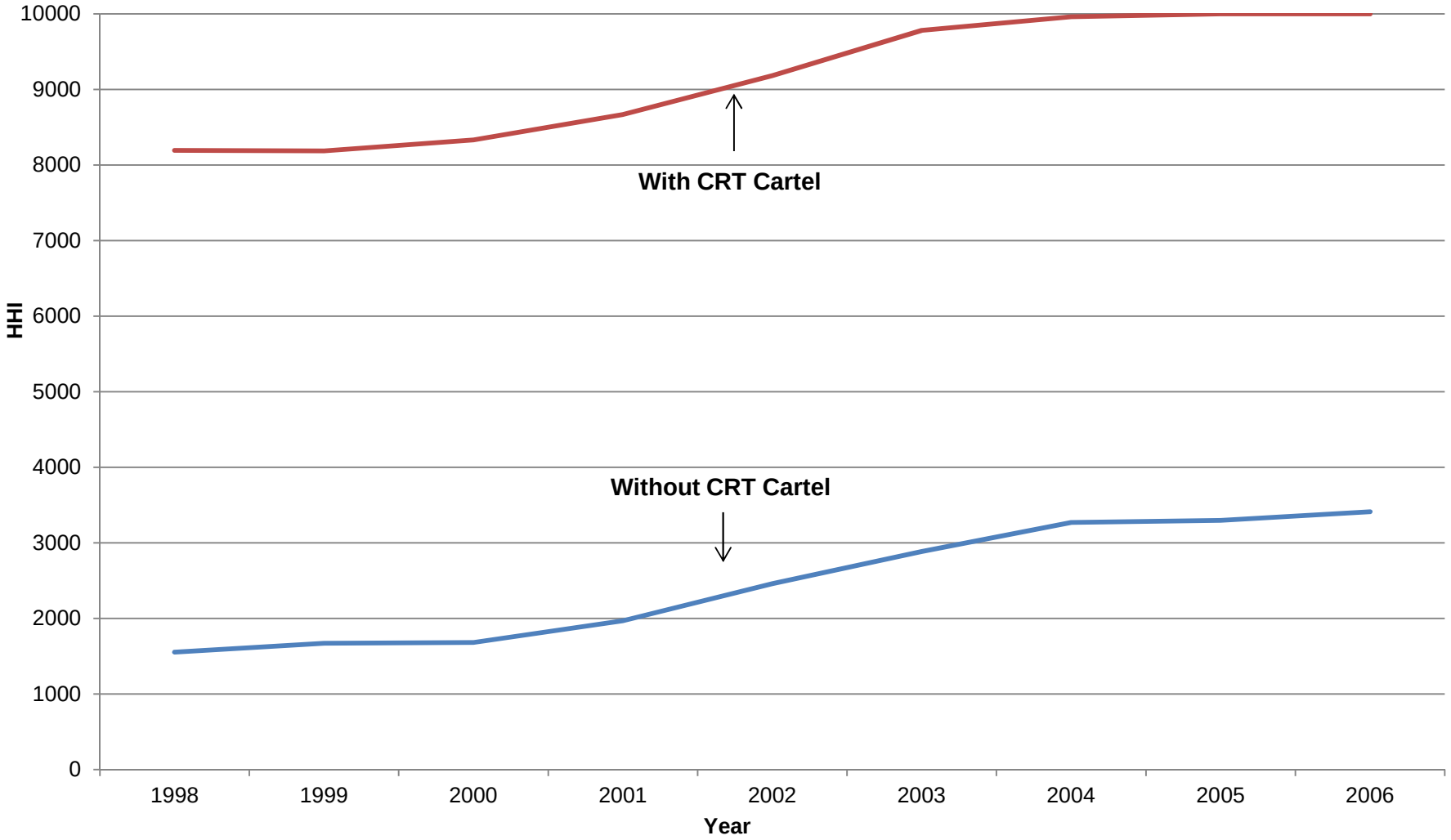
Note(s): 4Q06 CPT information appears to be projected as of 11/2006.
Data Source(s): See Exhibit 82.
Source File(s): CPT share.do; dta creator.do; Clean Shares.xlsx

HHI Over Time, Cartelized CPT Production vs. Non- Cartelized CPT Production



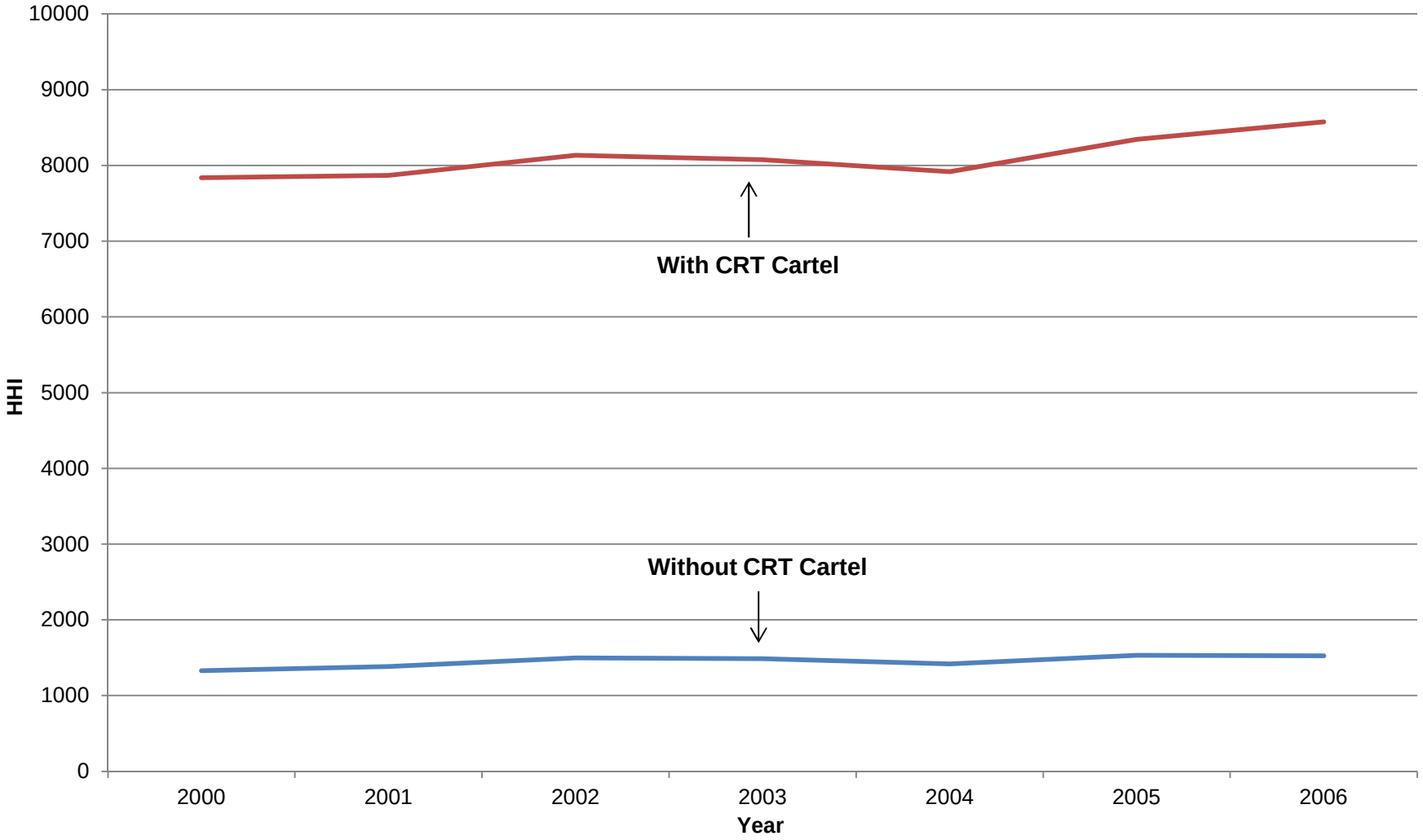
Note(s): 4Q06 CPT information appears to be projected as of 11/2006.
Data Source(s): See Exhibit 82.
Source File(s): HHI.do; dta creator.do; HHI.xlsx

HHI Over Time, Cartelized CDT Production vs. Non-Cartelized CDT Production



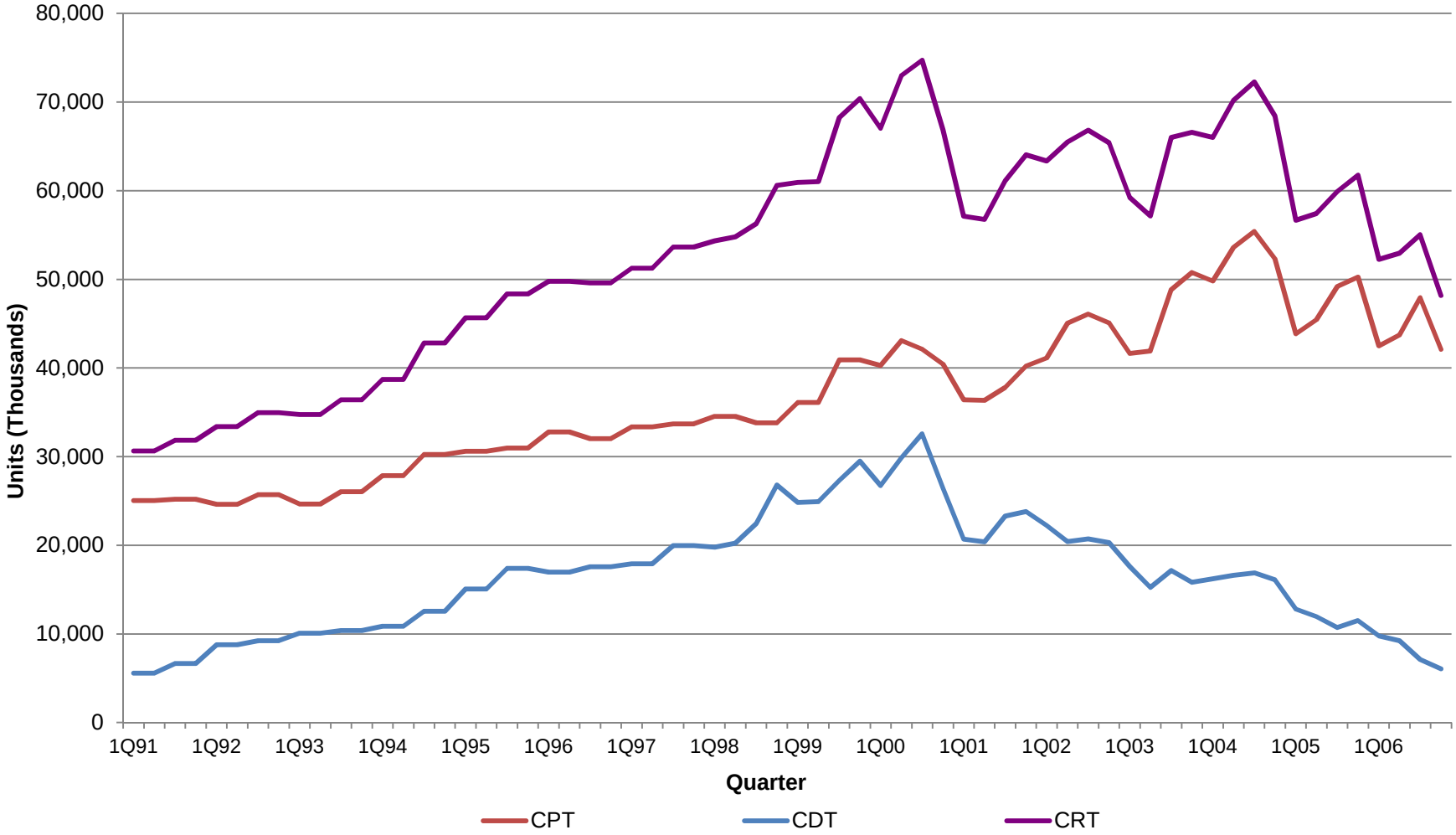
Note(s): 4Q03 CDT data are comprised of DisplaySearch projected quantities. There are no CDT market share data for 1Q04. "Others" CDT manufacturer assumed to be Orion in 3Q05 - 4Q06 based on CDT capacity information.
Data Source(s): See Exhibits 2 and 82.
Source File(s): HHI.do; dta creator.do; CDT Data.xlsx; HHI.xlsx

HHI Over Time, Cartelized CRT Production vs. Non-Cartelized CRT Production



Note(s): 4Q03 CDT data are comprised of DisplaySearch projected quantities. There are no CDT market share data for 1Q04. "Others" CDT manufacturer assumed to be Orion in 3Q05 - 4Q06 based on CDT capacity information. 4Q06 CPT information appears to be projected as of 11/2006.
Data Source(s): See Exhibits 2 and 82.
Source File(s): HHI.do; dta creator.do; CDT Data.xlsx; HHI.xlsx

Total Worldwide CRT Production by Tube Type



Note(s): There are no data for 1Q04 CDT; quantity value generated by taking midpoint between 4Q03 CDT and 2Q04 CDT. 4Q03 CDT data are comprised of DisplaySearch projected quantities. Data for years 1991-1997 in CDT and 1991-1999 in CPT are reported every half-year; the same values are assigned to corresponding quarters. 4Q06 CPT information appears to be projected as of 11/2006.
Data Source(s): See Exhibit 82.
Source File(s): total production.do; dta creator.do; total production.xlsx

CRT Distribution Diagram

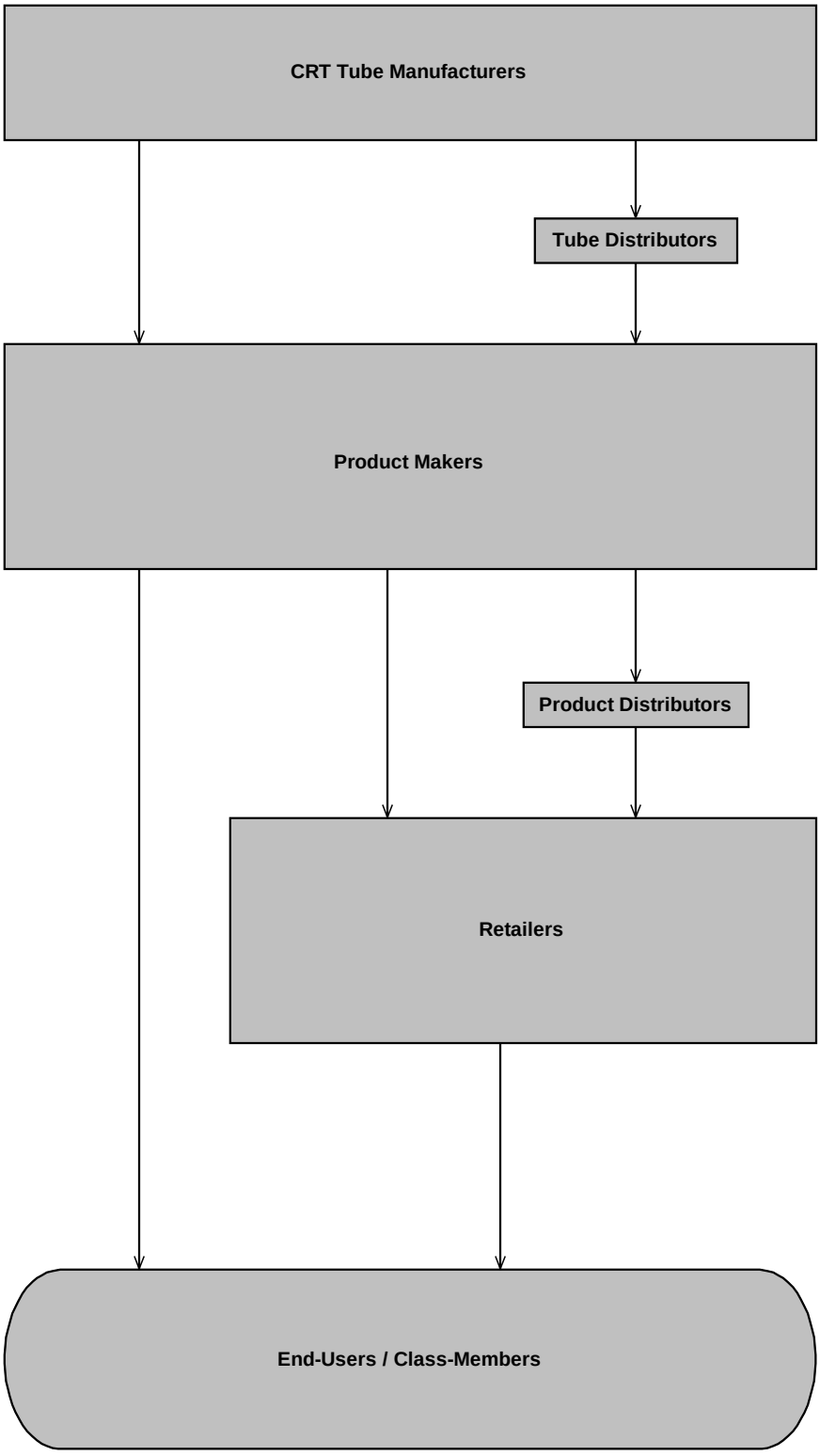
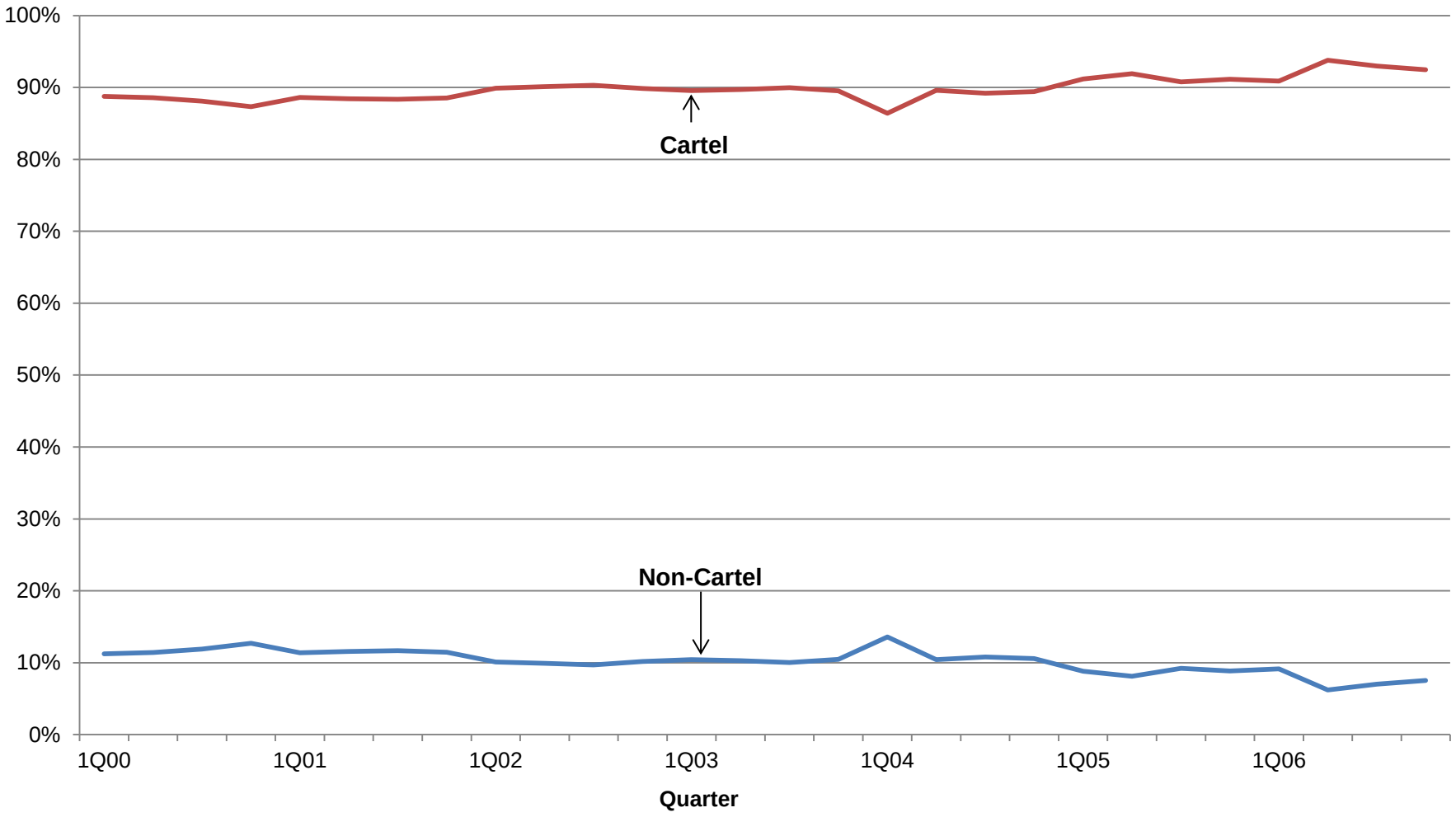


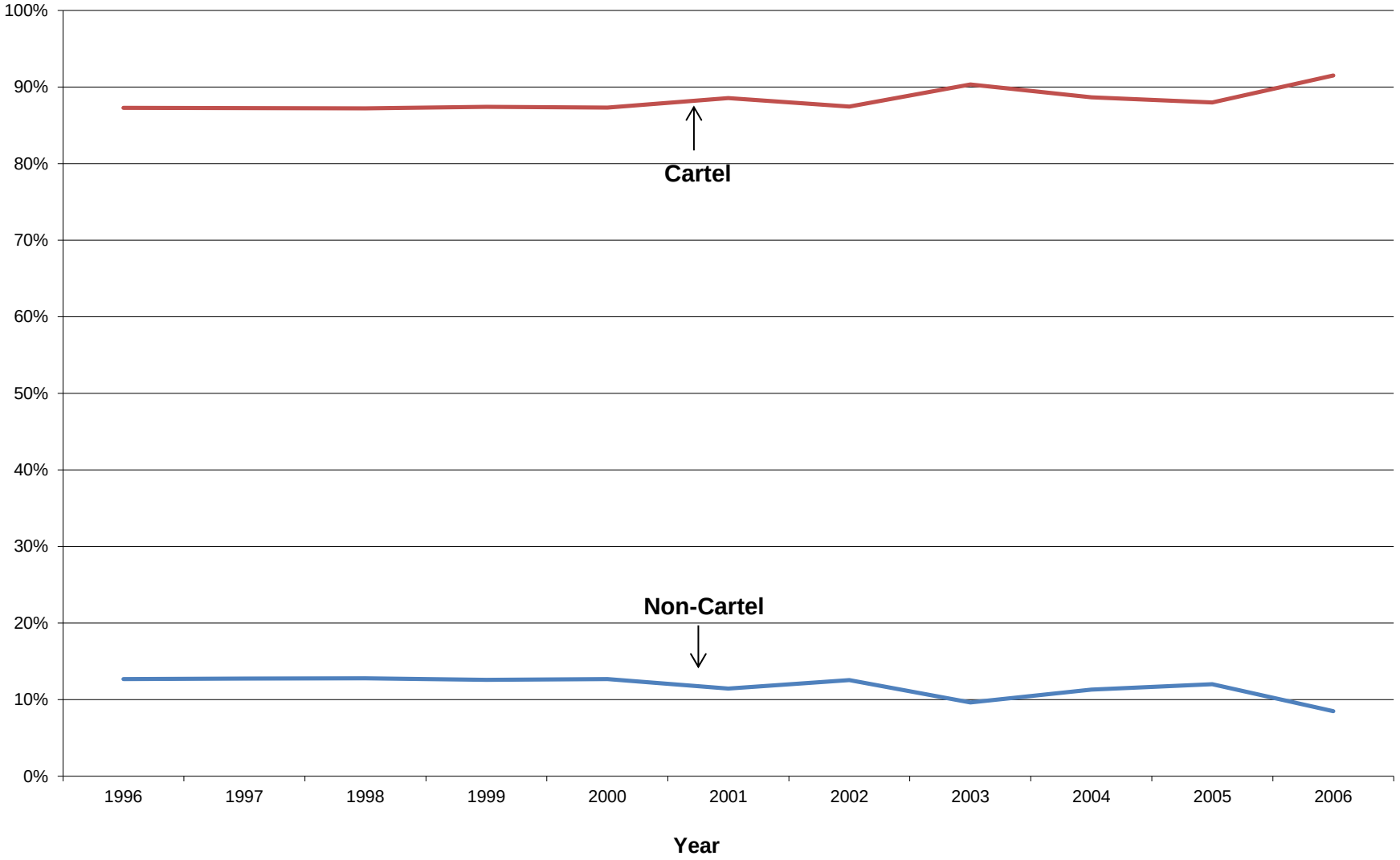
Exhibit 10

Worldwide CRT Production Shares



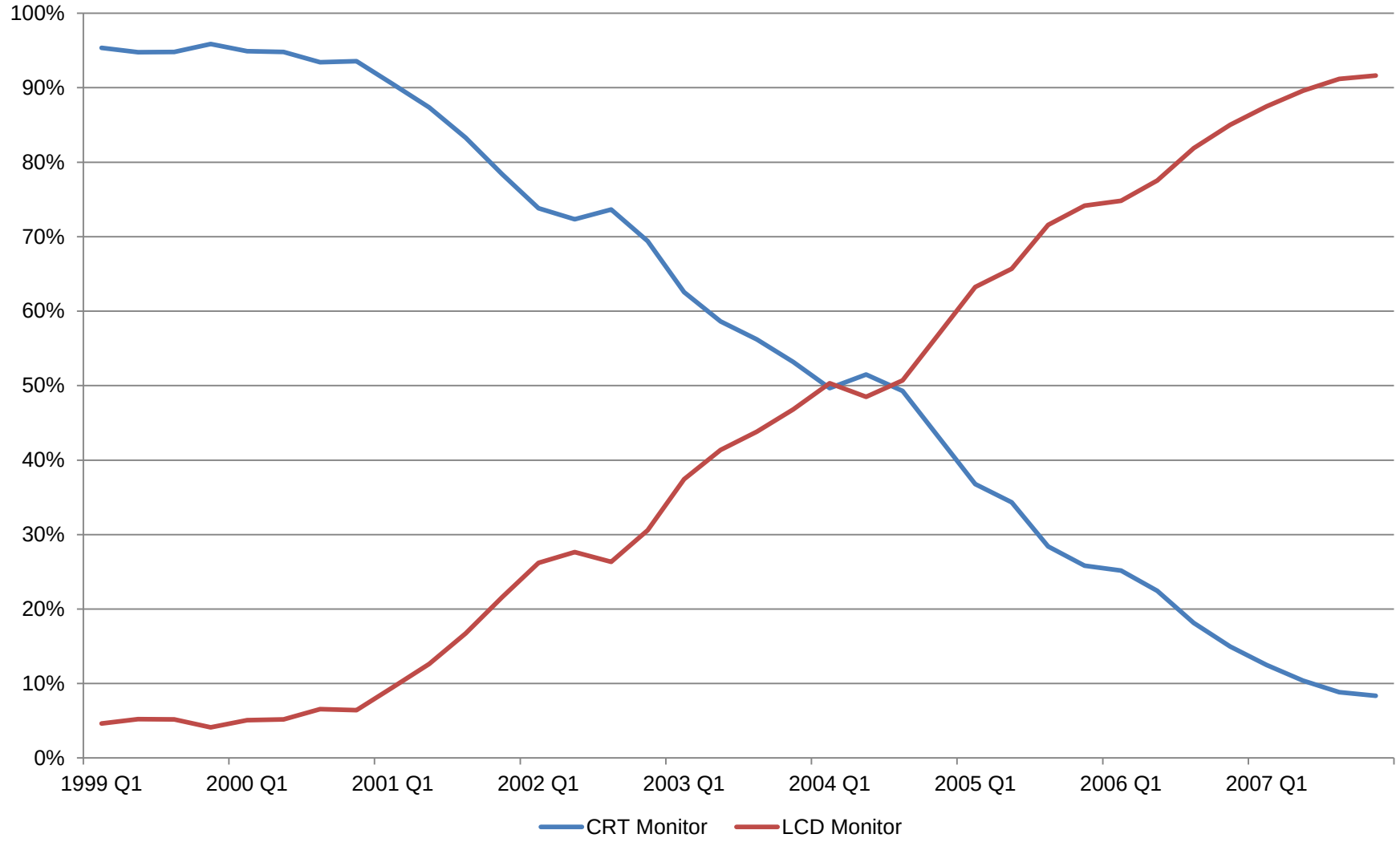
Note(s): 4Q03 CDT data are comprised of DisplaySearch projected quantities. There are no CDT market share data for 1Q04. "Others" CDT manufacturer assumed to be Orion in 3Q05 - 4Q06 based on CDT capacity information. 4Q06 CPT information appears to be projected as of 11/2006.
Data Source(s): See Exhibits 2 and 82.

Shares of Worldwide CRT Capacity



Data Source(s): See Exhibit 2.
Source File(s): Capacity Worksheets.xlsx; capacity shares.do; early_capacity_load.do; capacity_load.do; capacity_database.do;

Worldwide Monitor Share by Technology

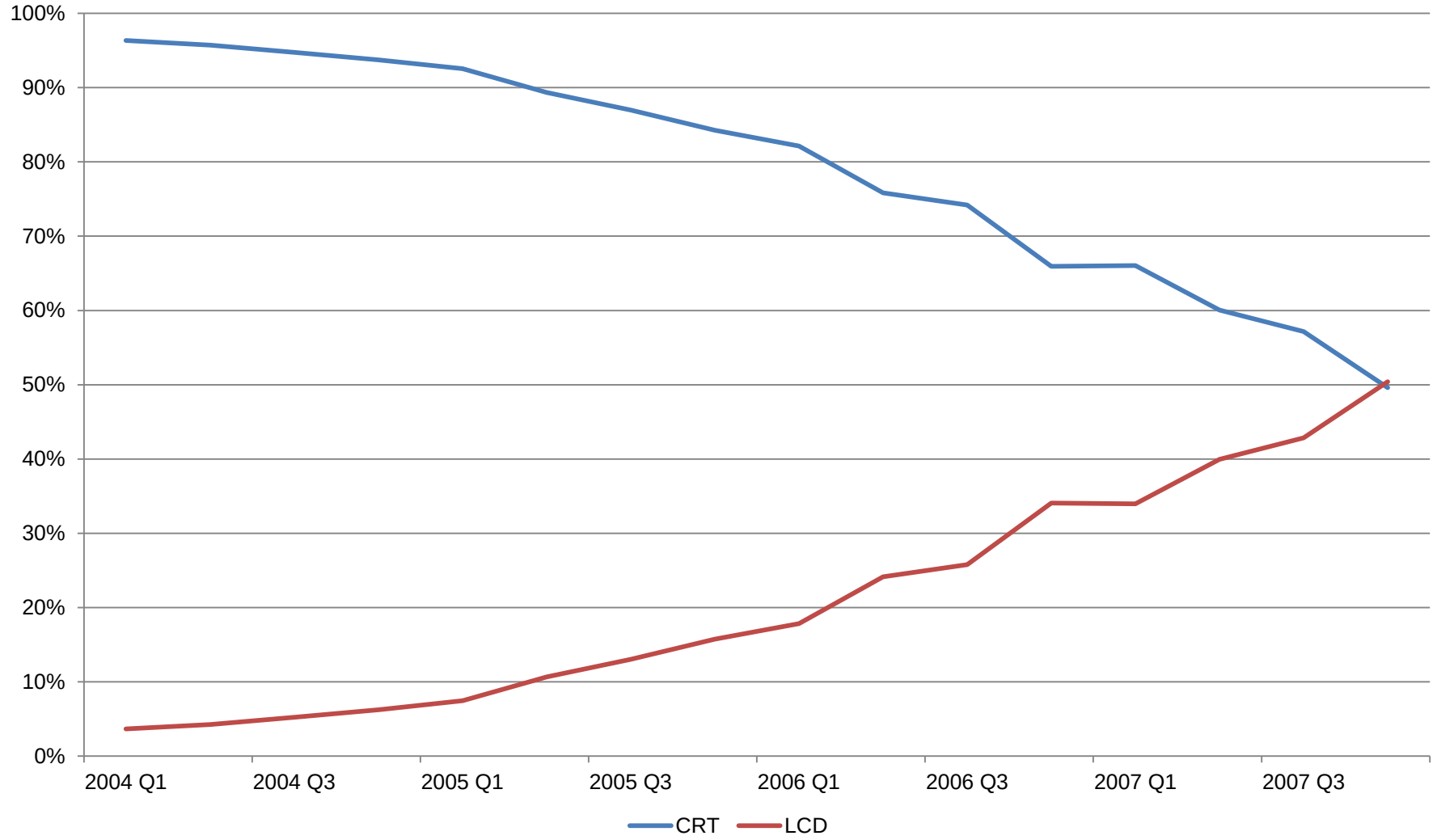


Data Source(s): DisplaySearch, May 2011, Analysis Group, Inc. Custom Data Project, DISP_LCD_000129.

Source File(s): aE_DISP_LCD-000129.xlsx

Exhibit 13

Worldwide TV Share by Technology



Data Source(s): DisplaySearch, May 2011, Analysis Group, Inc. Custom Data Project, DISP_LCD_000129.

Source File(s): aE_DISP_LCD-000129.xlsx

Exhibit 14

CDT Prices and Compound Annual Growth Rates

Year	Price		
	15" CDT	17" CDT	19" CDT
1995	$148.97	$255.27	
1996	$132.93	$235.59	
1997	$85.49	$172.16	$283.95
1998	$57.09	$102.69	$200.79
1999	$62.00	$93.52	$165.49
2000	$61.28	$85.01	$130.83
2001	$45.78	$66.73	$90.33
2002	$38.52	$53.73	$79.53
2003	$34.61	$46.05	$72.27
2004	$34.90	$45.31	$69.49
2005	$32.73	$40.51	$62.14
2006	$29.19	$35.62	$54.66
2007	$26.17	$31.81	$51.94
CAGR 1995-2001*	-17.9%	-20.0%	-24.9%
CAGR 2001-2007	-8.9%	-11.6%	-8.8%

Notes: * First listed CAGR for 19" CDTs is for period 1997-2001 because 19" CDT price data for 1995 and 1996 are unavailable.

Source File(s): average_price.do; average_price_all.xlsx

Data Source(s): Defendant data; see Exhibit 64.

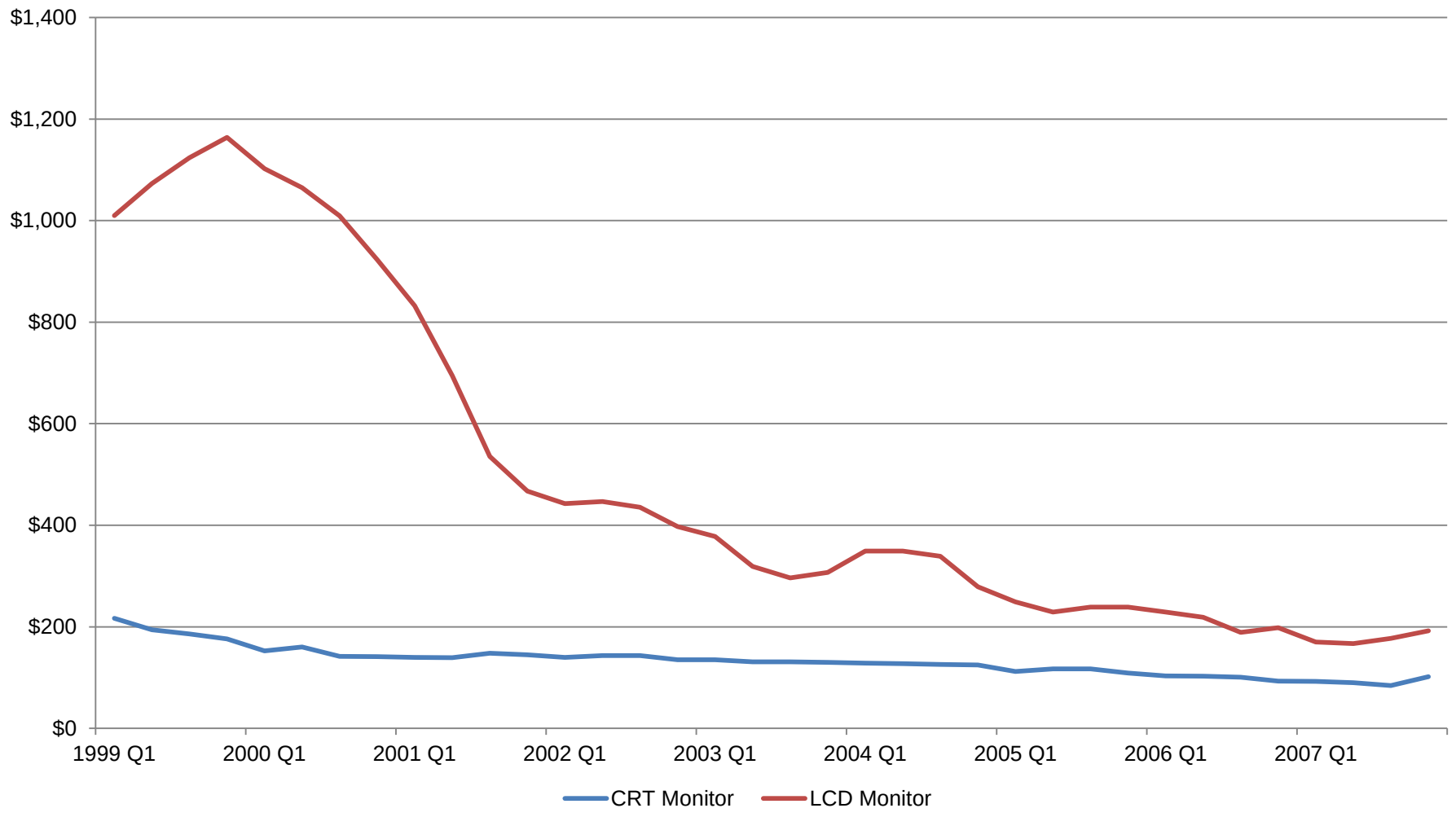
CPT Prices and Compound Annual Growth Rates

Year	Price			
	14" CPT	20" CPT	21" CPT	29" CPT
1995	$48.08	$68.60	$78.80	$161.61
1996	$47.72	$67.09	$76.85	$165.26
1997	$41.55	$61.66	$66.26	$159.06
1998	$33.33	$58.85	$59.59	$136.47
1999	$29.90	$51.71	$56.25	$142.86
2000	$32.33	$50.89	$55.93	$147.66
2001	$28.72	$49.27	$53.39	$127.06
2002	$23.29	$41.67	$47.82	$108.05
2003	$21.86	$37.55	$45.80	$103.68
2004	$21.36	$37.88	$43.93	$97.32
2005	$19.73	$37.52	$38.83	$82.22
2006	$17.29	$33.68	$33.61	$74.29
2007	$16.48	$31.77	$31.86	$71.37
CAGR 1995-2004	-8.6%	-6.4%	-6.3%	-5.5%
CAGR 2004-2007	-8.3%	-5.7%	-10.2%	-9.8%

Data Source(s): Defendant data; see Exhibit 64.

Source File(s): average_price.do; average_price_all.xlsx

15" Monitor Price by Technology

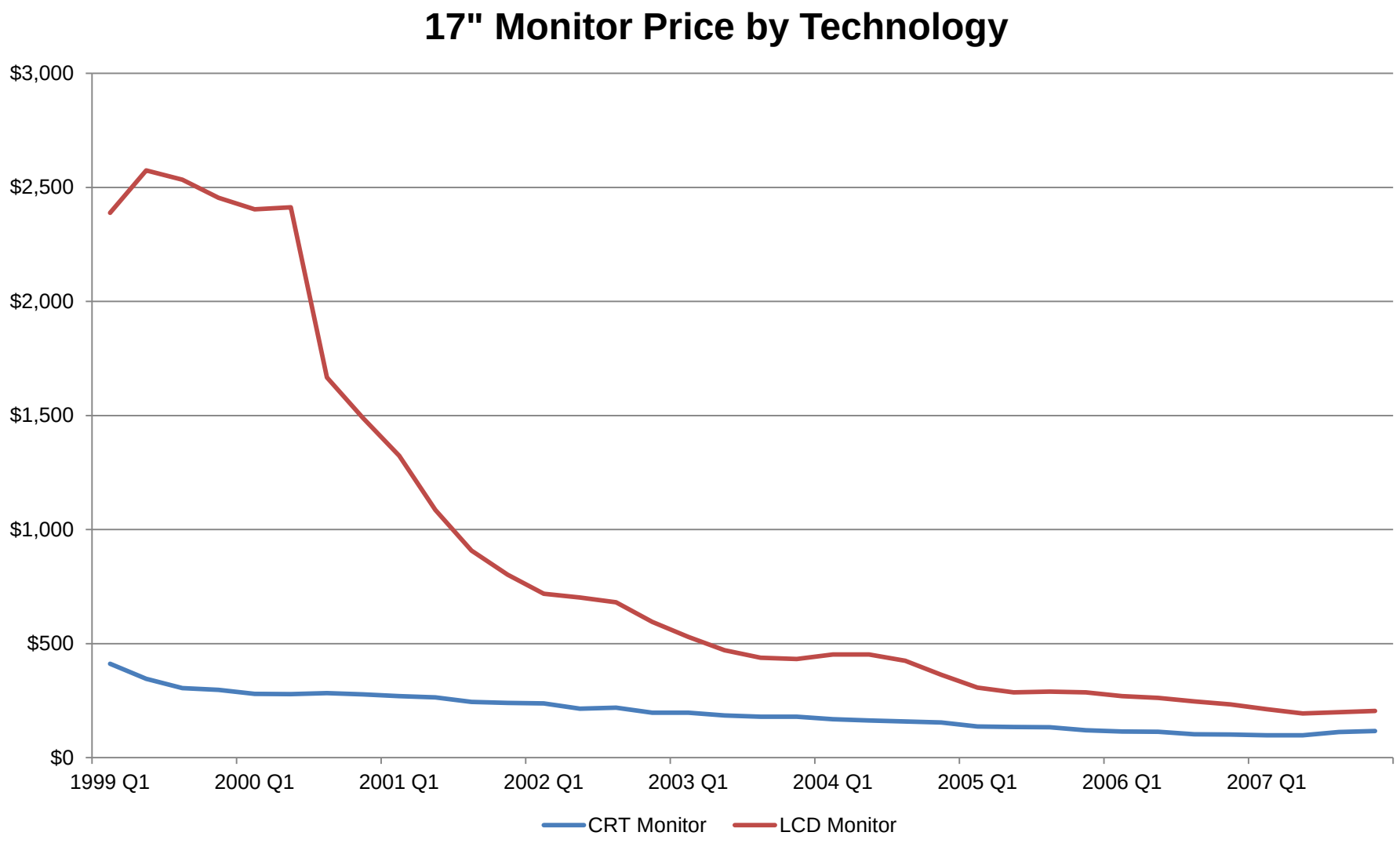


Note(s): Prices are global averages.

Data Source(s): DisplaySearch, May 2011, Analysis Group, Inc. Custom Data Project, DISP_LCD_000129.

Source File(s): aE_DISP_LCD-000129.xlsx

Exhibit 17



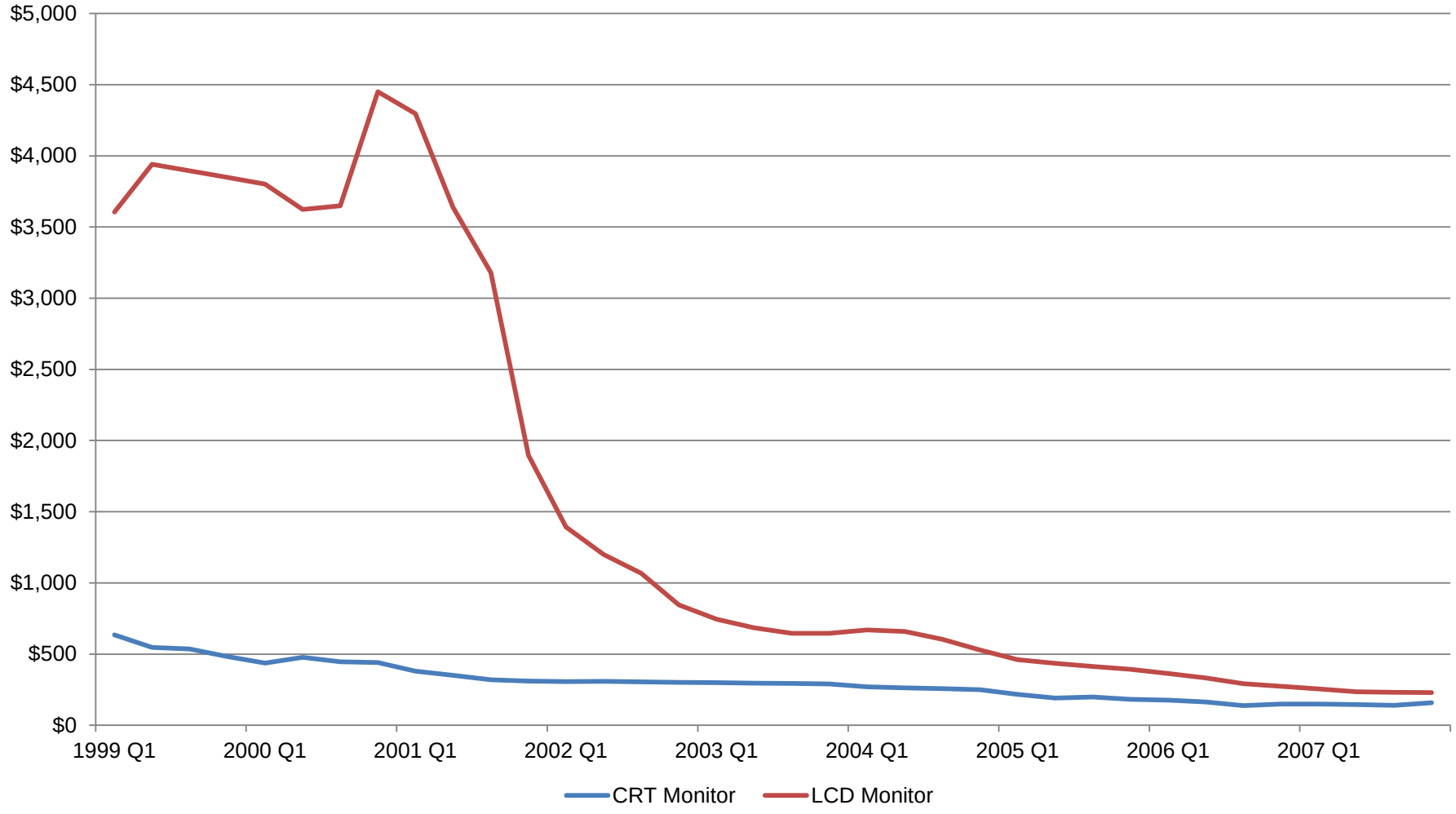
Note(s): Prices are global averages.

Data Source(s): DisplaySearch, May 2011, Analysis Group, Inc. Custom Data Project, DISP_LCD_000129.

Source File(s): aE_DISP_LCD-000129.xlsx

Exhibit 18

19" Monitor Price by Technology



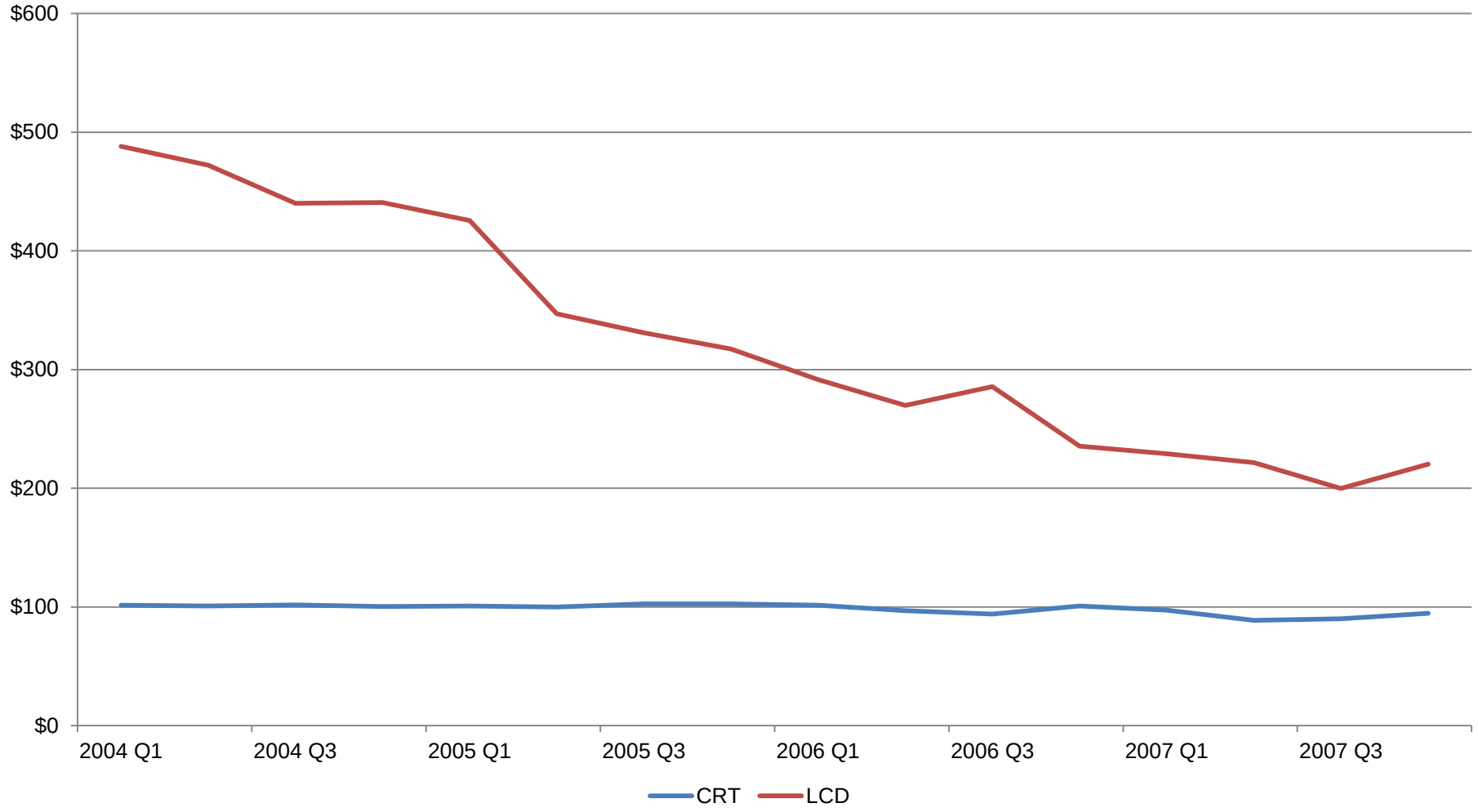
Note(s): 19" LCD price data are missing for Q3 and Q4 1999. I estimate these data linearly using Q2 1999 and Q1 2000 prices as end points. Prices are global averages.

Data Source(s): DisplaySearch, May 2011, Analysis Group, Inc. Custom Data Project, DISP_LCD_000129.

Source File(s): aE_DISP_LCD-000129.xlsx

Exhibit 19

10" - 14" TV Price by Technology

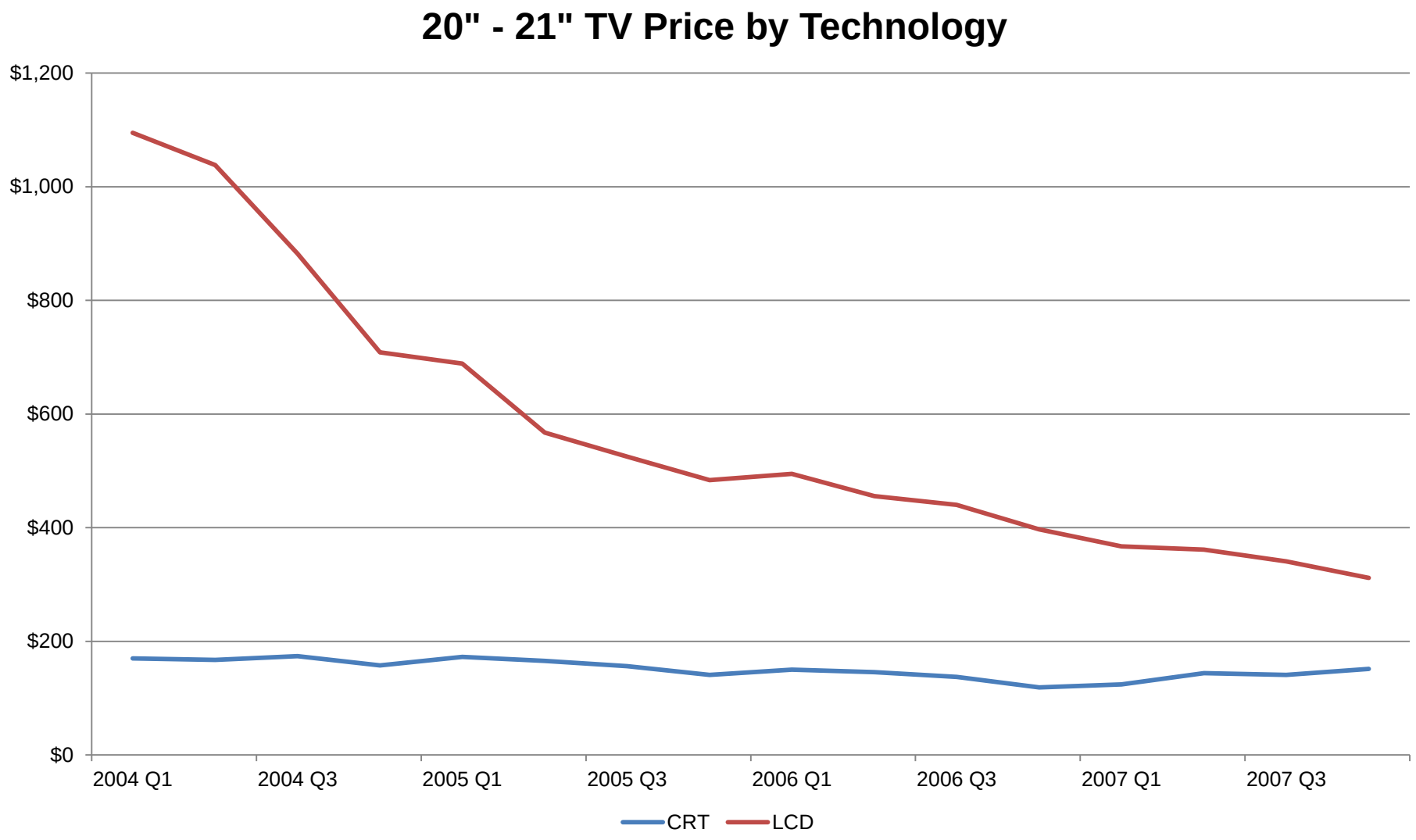


Note(s): Prices are global averages. TV price data are reported by size category.

Data Source(s): DisplaySearch, May 2011, Analysis Group, Inc. Custom Data Project, DISP_LCD_000129.

Source File(s): aE_DISP_LCD-000129.xlsx

Exhibit 20



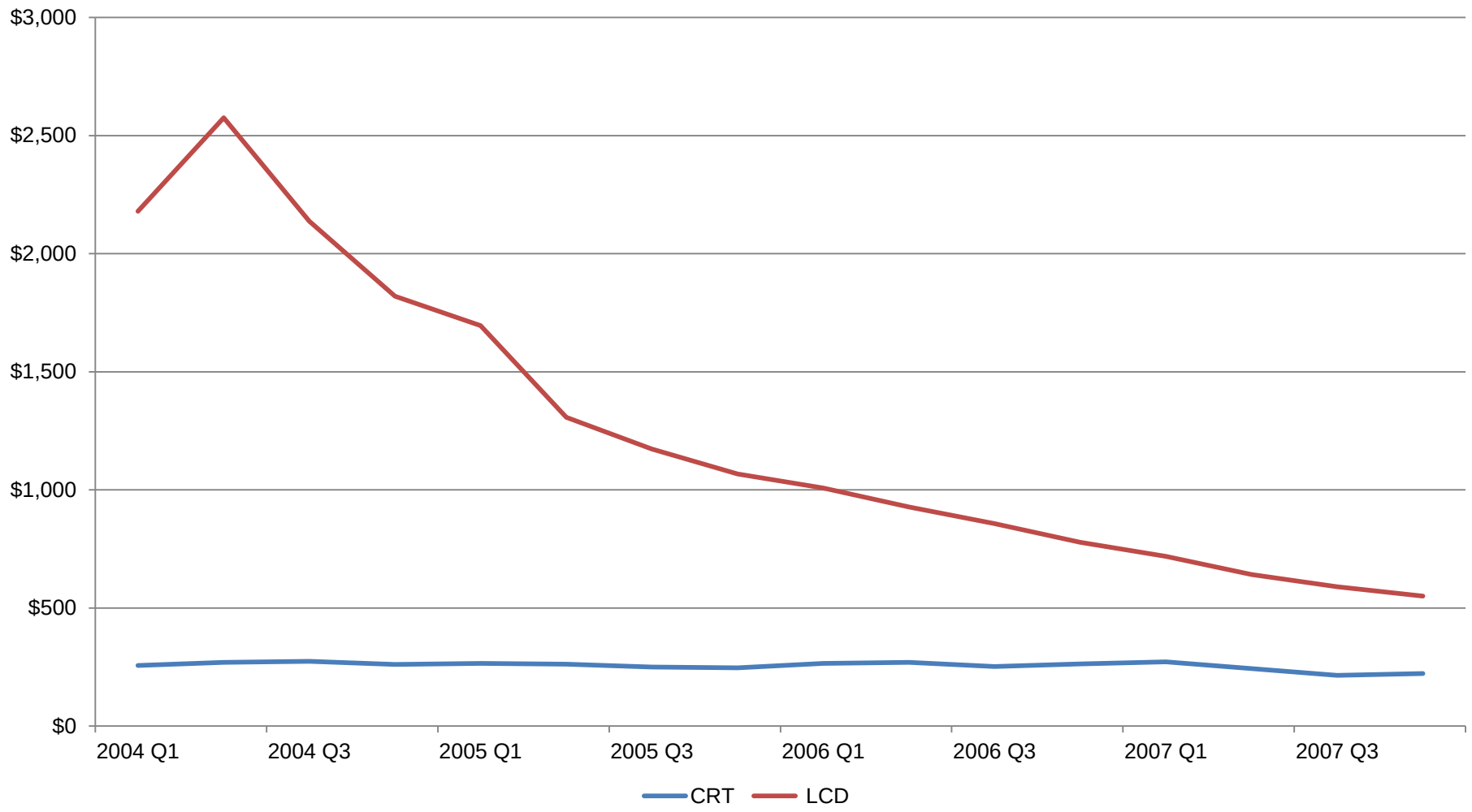
Note(s): Prices are global averages. TV price data are reported by size category.

Data Source(s): DisplaySearch, May 2011, Analysis Group, Inc. Custom Data Project, DISP_LCD_000129.

Source File(s): aE_DISP_LCD-000129.xlsx

Exhibit 21

25" - 29" TV Price by Technology



Note(s): Prices are global averages. TV price data are reported by size category.

Data Source(s): DisplaySearch, May 2011, Analysis Group, Inc. Custom Data Project, DISP_LCD_000129.

Source File(s): aE_DISP_LCD-000129.xlsx

Exhibit 22

Worldwide Quantity of LCD Monitors Sold

Year	Monitor Size			
	15"	17"	19"	20" - 21"
1999	3,156,997	58,500	97	29,095
2000	4,643,969	244,858	5,043	40,098
2001	12,214,705	1,866,912	19,469	103,701
2002	22,180,311	6,875,917	467,007	338,373
2003	24,515,928	18,549,278	2,343,642	826,353
2004	22,486,475	35,663,864	7,822,250	1,713,654
2005	17,098,234	62,202,952	23,081,926	3,066,182
2006	14,251,796	66,796,834	41,775,168	6,446,964
2007	11,317,648	58,745,873	64,874,135	11,674,679
Grand Total	131,866,063	251,004,988	140,388,737	24,239,099

Note(s): Larger sizes omitted. Listed sizes make up roughly 95% of total monitor sales from 1999-2007.

Data Source(s): DisplaySearch, May 2011, Analysis Group, Inc. Custom Data Project, DISP_LCD_000129.

Source File(s): aE_DISP_LCD-000129.xlsx

Worldwide Quantity of LCD TVs Sold

Year	TV Size							
	10" - 14"	15" - 19"	20" - 21"	22" - 24"	25" - 29"	30" - 34"	35" - 39"	40" - 44"
2002	304,075	646,325	296,835	64,450	3,775	31,050	3,000	1,680
2003	522,748	1,608,129	907,009	303,860	126,255	382,742	67,117	10,776
2004	888,093	2,315,915	2,126,550	681,791	1,106,449	1,451,294	153,636	24,289
2005	802,509	3,844,833	4,056,839	1,108,180	3,753,094	5,821,965	1,063,494	591,421
2006	321,006	4,710,428	7,409,202	1,372,746	6,721,851	15,327,263	4,040,632	4,885,046
2007	177,006	8,042,658	6,845,568	1,707,520	9,221,414	27,294,461	8,174,037	12,910,594
Grand Total	3,015,437	21,168,288	21,642,003	5,238,547	20,932,838	50,308,775	13,501,916	18,423,806

Notes: Larger sizes omitted. Listed sizes make up over 96% of total LCD TV sales from 2002-2007.
Data Source(s): DisplaySearch, May 2011, Analysis Group, Inc. Custom Data Project, DISP_LCD_000129.
Source File(s): aE_DISP_LCD-000129.xlsx

Gain in CPT Sales Necessary for 5% Price Decline to be Profitable

Year	Defendant CPT Production	Additional Sales Needed for 5% Price Decline to be Profitable	Total LCD TV Sales	Critical Gain/Total LCD TV Sales
1995	87,753,158	12,536,165		
1996	110,199,974	15,742,853		
1997	113,950,892	16,278,699		
1998	116,198,694	16,599,813		
1999	130,942,359	18,706,051		
2000	143,169,400	20,452,771		
2001	129,361,300	18,480,186		
2002	154,801,876	22,114,554	1,351,190	1637%
2003	158,202,742	22,600,392	3,928,636	575%
2004	182,097,721	26,013,960	8,766,144	297%
2005	168,130,444	24,018,635	21,167,909	113%
2006	160,699,222	22,957,032	45,989,894	50%
2007	125,871,823	17,981,689	79,194,161	23%
Total	**1,781,379,604**	**254,482,801**	**160,397,934**	**159%**

Notes: I assume a 40% gross profit margin prior to the hypothetical 5% price reduction. Under these assumptions, defendants must sell at least 14% more units for a 5% price reduction to be profitable. Defendant tube production in 1995 and 2007 is limited to the months included in the class period.

Data Source(s): DisplaySearch, May 2011, Analysis Group, Inc. Custom Data Project, DISP_LCD_000129.
Total damages data; see Exhibit 84.

Source File(s): total_damages_exhibits.do; total_damages_exhibits.xlsx

Gain in CDT Sales Necessary for 20% Price Decline to be Profitable

Year	Defendant CDT Production	Additional Sales Needed for 20% Price Decline to be Profitable	Total LCD Monitor Sales	Critical Gain/Total LCD Monitor Sales
1995	47,818,389	47,818,389		
1996	66,382,000	66,382,000		
1997	71,545,000	71,545,000		
1998	80,532,000	80,532,000		
1999	96,120,000	96,120,000	4,490,422	2141%
2000	105,066,000	105,066,000	6,137,542	1712%
2001	82,000,000	82,000,000	15,712,661	522%
2002	80,193,000	80,193,000	32,190,361	249%
2003	65,126,000	65,126,000	49,205,397	132%
2004	65,635,000	65,635,000	68,973,084	95%
2005	46,963,869	46,963,869	106,156,730	44%
2006	32,173,986	32,173,986	131,369,756	24%
2007	17,872,152	17,872,152	162,519,167	11%
Total	**857,427,395**	**857,427,395**	**576,755,120**	**149%**

Note(s): I assume a 40% gross profit margin prior to the hypothetical 20% price reduction. Under these assumptions, defendants must sell at least 100% more units for a 20% price reduction to be profitable. Defendant tube production in 1995 and 2007 is limited to the months included in the class period.

Data Source(s): DisplaySearch, May 2011, Analysis Group, Inc. Custom Data Project, DISP_LCD_000129.

Total damages data; see Exhibit 84.

Source File(s): total_damages_exhibits.do; total_damages_exhibits.xlsx

Glass Meeting Attendees

Date	Chunghwa	LG	Daewoo	Samsung	Hitachi	Panasonic	Mitsubishi	Toshiba	Philips	LPD	MTPD	Thai CRT	IRICO	Samtel	Thomson	Citation
8/23/1999	X	X	X	X							X					23 August 1999, TV Glass Meeting Agenda, CHU00029070 - CHU00029082.
10/20/1999	X		X					X								Ross, David, 20 October 1999, Glass Meeting Report, CHU00029044 - CHU00029045.
11/11/1999	X	X	X	X				X								Chunghwa Picture Tubes, LTD Picture Tubes, LTD, 11 November 1999, Contact Report, Topic: European TV Glass Meeting , CHU00030917 - CHU00030919.
9/18/2000	X		X	X				X								CPT, David Ross, 18 September 2000, Report on Glass Meeting, CHU00022728 - CHU00022730.
2/23/2001	X	X	X	X				X								Lee, Jae In, 23 February 2001, GSM Meeting (SDI), SDCRT-0087405 - SDCRT-0087407.
3/19/2001	X	X	X	X				X								Lee, Jae In, 19 March 2001, GSM March MTG (Philips), SDCRT-0087408 - SDCRT-0087410.
4/19/2001	X	X	X	X				X								Lee, Jae In, 19 April 2001, GSM (LG office), SDCRT-0087411 - SDCRT-0087413.
6/26/2001	X	X	X	X				X			X					Samsung, 26 June 2001, TV Glass meeting, SDCRT-0005831 - SDCRT-0005842.
6/27/2001	X		X	X					X							Lee, Jae In, 27 June 2001, GSM MTG (Orion), SDCRT-0087417 - SDCRT-0087422.
10/15/2001	X		X	X					X							Lee, Jae In, 15 October 2001, GSM MTG (SDI), SDCRT-0087427 - SDCRT-0087429.
12/17/2001	X		X	X					X							Samsung SDI, 17 December 2001, GSM Meeting, SDCRT-0087437 - SDCRT-0087440.
2/??/02	X		X						X							Lin, Chieng-Yuan, Liu, Chih-Chun, et al., 6 March 2002, GSM Meeting Glasgow 0202, CHU00022583 - CHU00022585.
3/20/2002	X		X	X					X							Chunghwa Picture Tubes, LTD, 20 March 2002, 3/20 GSM TV Tube Market Condition Explanation, CHU00123746 - CHU00123747.
4/22/2002	X		X	X					X							Samsung SDI, 22 April 2002, GSM Meeting Log in April of 2002, SDCRT-0087743 - SDCRT-0087744.
5/28/2002	X		X	X					X							28 May 2002, Glass Meeting, SDCRT-0007588 - SDCRT-0007594.
10/25/2002			X	X					X					X		Samsung, 25 October 2002, GSM MTG, SDCRT-0087708 - SDCRT-0087718.
11/25/2002			X	X					X					X		Samsung, 25 November 2002, GSM Meeting, SDCRT-0087719 - SDCRT-0087736.
2/21/2003	X						X		X		X					Chunghwa Picture Tubes, LTD Picture Tubes (Fuzhou), Yeh, Chung-Cheng (Alex), 21 February 2003, Market Visitation (Glass Meeting) Report (For Submission), CHU00030557 - CHU00030558.
3/21/2003	X			X						X						CPT, 21 March 2003, 3/21 '03 GSM Meeting, CHU00014182 - CHU00014185.
5/22/2003	X			X						X	X	X				Chunghwa Picture Tubes, LTD Picture Tubes, LTD, 22 May 2003, Market Visitation Report (Glass Meeting), CHU00030547 - CHU00030552.
8/5/2003				X						X	X					Samsung Samsung SDI, 05 August 2003, 1st Glass TOP MEETING Results Report, SDCRT-0088726 - SDCRT-0088730.
9/5/2003	X			X						X	X	X				Chunghwa Picture Tubes, LTD Picture Tubes, LTD, 05 September 2003, Market Visitation Report (TV Glass Meeting), CHU00030060 - CHU00030063.
10/29/2003	X			X						X						Samsung Samsung SDI, 29 October 2003, CDT Glass Meeting Results Report, SDCRT-0088819 - SDCRT-0088821.
11/7/2003	X			X						X	X	X				CPT, 07 November 2003, Market Visitation Report (Glass Meeting), CHU00030071 - CHU00030078.
11/12/2003	X			X						X	X	X				Yang, Sheng-Jen (S.J.), Chen, Shih-Ming (Maxim), 12 November 2003, Marketing Contact Report (Glass meeting), CHU00030058 - CHU00030059.
11/28/2003				X						X	X					Samsung Samsung SDI, 28 November 2003, 9 GLASS MTG, SDCRT-0088743 - SDCRT-0088748.

Date	Chunghwa	LG	Daewoo	Samsung	Hitachi	Panasonic	Mitsubishi	Toshiba	Philips	LPD	MTPD	Thai CRT	IRICO	Samtel	Thomson	Citation
2/16/2004	X			X						X	X	X				Chunghwa Picture Tubes, LTD Picture Tubes, LTD, 16 February 2004, Market Visitation Report (Glass Meeting), CHU00030036 - CHU00030039.
3/8/2004	X			X						X						Samsung Samsung SDI, 08 March 2004, Report on Glass MTG Results, SDCRT-0090278 - SDCRT-0090279.
3/16/2004	X			X						X	X	X				Chen, Shih-Ming (Maxim), 16 March 2004, Market Visitation Report (Glass Meeting), CHU00124020 - CHU00124021.
4/23/2004	X			X						X	X	X				23 April 2004, Market Visitation Report (Glass Meeting), CHU00030533 - CHU00030536.
5/18/2004	X			X						X	X	X				Chunghwa Picture Tubes, LTD Picture Tubes, LTD, 18 May 2004, Market Visitation Report (Glass Meeting), CHU00030530 - CHU00030532.
06/??/04	X			X						X						Samsung Samsung SDI, June 2004, Report the results of the Glass Working Meeting, SDCRT-0090312 - SDCRT-0090313.
6/18/2004	X			X						X	X	X				Chen, Shih-Ming (Maxim), 18 June 2004, Marketing Visitation Report (Glass Meeting), CHU00124116 - CHU00124118.
7/22/2004	X			X						X	X	X				22 July 2004, Market Visitation Report (Glass Meeting), CHU00030520 - CHU00030523.
7/26/2004	X			X						X						Lee, Jae In, 26 July 2004, SDI CDT glass MTG - Itinerary, SDCRT-0090322 - SDCRT-0090328.
9/17/2004	X			X						X	X	X				Chunghwa Picture Tubes, LTD Picture Tubes, LTD, 17 September 2004, Marketing Contact Report (Glass Meeting), CHU00030506 - CHU00030511.
11/5/2004	X			X						X	X	X				05 November 2004, Marketing Contact Report (Glass Meeting), CHU00030502 - CHU00030504.
11/15/2004	X			X						X						Samsung Samsung SDI, 15 November 2004, Report the results of the Glass working meeting on Nov. 15 , SDCRT-0090350 - SDCRT-0090353.
12/28/2004	X			X						X	X	X				Yang, Chen, Shih-Ming (Maxim), et al., 28 December 2004, Marketing Contact Report (Glass meeting), CHU00029990 - CHU00029993.
2/9/2005				X						X					X	Samsung SDI, 09 February 2005, Glass meeting in Amsterdam, SDCRT-0091491 - SDCRT-0091504.
2/25/2005	X			X						X	X	X				Veronica, Jess, 25 February 2005, Marketing Contact Report (Glass Meeting), CHU00030499 - CHU00030499 .
3/22/2005				X						X					X	Samsung, 22 March 2005, Glass Meeting in Amsterdam, SDCRT-0002984 - SDCRT-0002988.
4/26/2005	X			X						X						Chunghwa Picture Tubes, LTD, 26 April 2005, 4/26 '05 GSM (Seoul), CHU00735380 - CHU00735393.
4/29/2005	X			X						X	X	X				Chunghwa Picture Tubes, LTD Picture Tubes, LTD, 29 April 2005, Market Visitation Report (Glass Meeting), CHU00030495 - CHU00030496.
6/9/2005	X			X						X	X	X				Chen, Shih-Ming (Maxim), 09 June 2005, Market Visitation Report (Glass Meeting), CHU00030491 - CHU00030494.
8/8/2005	X			X						X						Chunghwa Picture Tubes, LTD Picture Tubes, LTD, 08 August 2005, Glass Meeting Meeting Information, CHU00017069 - CHU00017074.
9/19/2005	X			X						X	X	X				Chunghwa Picture Tubes, LTD, 19 September 2005, GSM meeting material, CHU00017092 - CHU00017099.
9/22/2005	X			X						X	X	X				Chen, Hwang-Yun (Henry), Chen, Mu-Lin (Jimmy), 22 September 2005, Market Visitation Report (Glass Meeting), CHU00030472 - CHU00030473.

Date	Chunghwa	LG	Daewoo	Samsung	Hitachi	Panasonic	Mitsubishi	Toshiba	Philips	LPD	MTPD	Thai CRT	IRICO	Samtel	Thomson	Citation
9/28/2005	X			X						X						Chunghwa Picture Tubes, LTD, 28 September 2005, GSM Top Management Meeting, CHU00014230 - CHU00014231.
10/21/2005	X			X						X	X	X				Chunghwa Picture Tubes, LTD Picture Tubes, LTD, 21 October 2005, Market Visitation Report (Glass Meeting), CHU00030468 - CHU00030471.
10/24/2005	X			X						X						CPT, 31 October 2005, Subject: GLASSMEETING Meeting Materials, CHU00017125 - CHU00017129.
11/21/2005	X			X						X						Samsung SDI, LG Philips Displays, et al., 21 November 2005, GSM Meetiing , CHU00014227 - CHU00014229.
12/6/2005	X			X						X	X	X				Chen, Mu-Lin (Jimmy), 06 December 2005, Market Visitation Report (Glass Meeting), CHU00030465 - CHU00030467.
12/20/2005	X			X						X						20 December 2005, December Period CDT GSM Meeting, CHU00125657 - CHU00125658.
3/9/2006	X			X						X	X	X				Chunghwa Picture Tubes, LTD Picture Tubes, LTD, 09 March 2006, Market Visitation Report (Glass Meeting), CHU00030458 - CHU00030469.
3/14/2006	X			X						X						14 March 2006, Visitation Report (GSM Meeting), CHU00014215 - CHU00014217.
5/8/2006	X			X						X						Lu, Wei-Rong (Bruce), 08 May 2006, Subject: Glass Meeting Meeting Information, CHU00032196 - CHU00032196.
9/5/2006	X			X						X	X	X				Chunghwa Picture Tubes, LTD Picture Tubes, LTD, 05 September 2006, Market Visitation Report (Glass Meeting), CHU00030449 - CHU00030457.
11/9/2006	X			X						X	X	X				Chen, Mu-Lin (Jimmy), November 2006, Market Visitation Report (Glass Meeting), CHU00119571 - CHU00119573.
2/7/2007	X			X						X	X					Jimmy, Wu, Meng Ying, 7 February 2007, Market Visitation Report (Glass Meeting), CHU00030437 - CHU00030438.

Cartel Meetings Resulting in Capacity or Production Control

Meeting Date	Bates Number	Manufacturer	Type	Capacity Control	Production Control
11/23/1996	CHU00028786	Chunghwa, Orion, Samsung	CDT	X	X
1/28/1997	CHU00028768	Chunghwa, Orion, Philips, Samsung	CDT		X
2/24/1997	CHU00028763	Chunghwa, Orion, Philips, Samsung	CDT		X
3/12/1997	CHU00028758	Chunghwa, LG, Orion, Philips, Samsung	CDT		X
7/31/1998	SDCRT-0086419	Chunghwa, LG, Philips, Samsung	CDT		X
9/7/1998	SDCRT-0086421	Chunghwa, LG, Orion, Philips, Samsung	CDT	X	X
9/8/1998	CHU00030670	Chunghwa, LG, Orion, Samsung	CPT		X
11/6/1998	CHU00030684	Chunghwa, Irico, Matsushita, Orion, Philips, Samsung	CDT		X
11/30/1998	SDCRT-0086445	Chunghwa, LG, Orion, Philips, Samsung	CDT		X
12/11/1998	SDCRT-0086449	Chunghwa, Orion, Philips	CDT		X
3/1/1999	CHU00030720	Chunghwa, LG	CDT		X
3/15/1999	CHU00030731	Chunghwa, LG, Orion, Philips, Samsung	CDT		X
3/22/1999	SDCRT-0086577	Chunghwa, LG, Orion, Philips	CDT		X
3/31/1999	SDCRT-0086569	Chunghwa, LG, Orion, Philips, Samsung	CDT		X
4/10/1999	SDCRT-0086584	Chunghwa, LG, Orion, Philips, Samsung	CDT		X
5/21/1999	SDCRT-0086632	Chunghwa, LG, Orion, Philips, Samsung	CDT		X
5/23/1999	TSB-CRT-00045123	Irico, LG, Matsushita, Novel, Philips, SEG-Hitachi, Samsung, Thomson	CPT		X
6/23/1999	CHU00030787	LG, Orion, Samsung	CDT		X
7/23/1999	CHU00030809	Chunghwa, LG, Orion, Philips, Samsung	CDT		X
8/20/1999	CHU00030835	Chunghwa, LG, Orion, Philips, Samsung	CDT		X
8/22/1999	CHU00030839	LG, Orion, Samsung	CDT		X
9/7/1999	SDCRT-0086691	Chunghwa, LG, Orion, Philips, Samsung	CDT		X
9/20/1999	CHU00030855	Chunghwa, LG, Orion, Philips, Samsung	CDT		X
1/24/2000	CHU00029152	Chunghwa, LG, Orion, Philips, Samsung, Thai-CRT	CPT		X
1/24/2000	CHU00030960	Chunghwa, LG, Orion, Philips, Samsung	CDT		X
2/24/2000	CHU00030965	Chunghwa, LG, Orion, Philips, Samsung	CDT		X
3/31/2000	CHU00030985	Chunghwa, LG, Orion, Philips, Samsung	CDT		X
4/10/2000	CHU00030998	Samsung	CDT		X
5/9/2000	CHU00031002	Samsung	CPT and CDT		X
5/26/2000	CHU00031006	Chunghwa, LG, Orion, Philips, Samsung	CDT		X
6/6/2000	CHU00031017	Samsung	CDT		X
6/20/2000	CHU00031010	Chunghwa, LG, Orion, Philips, Samsung	CDT		X
8/11/2000	CHU00031040	Samsung	CDT		X

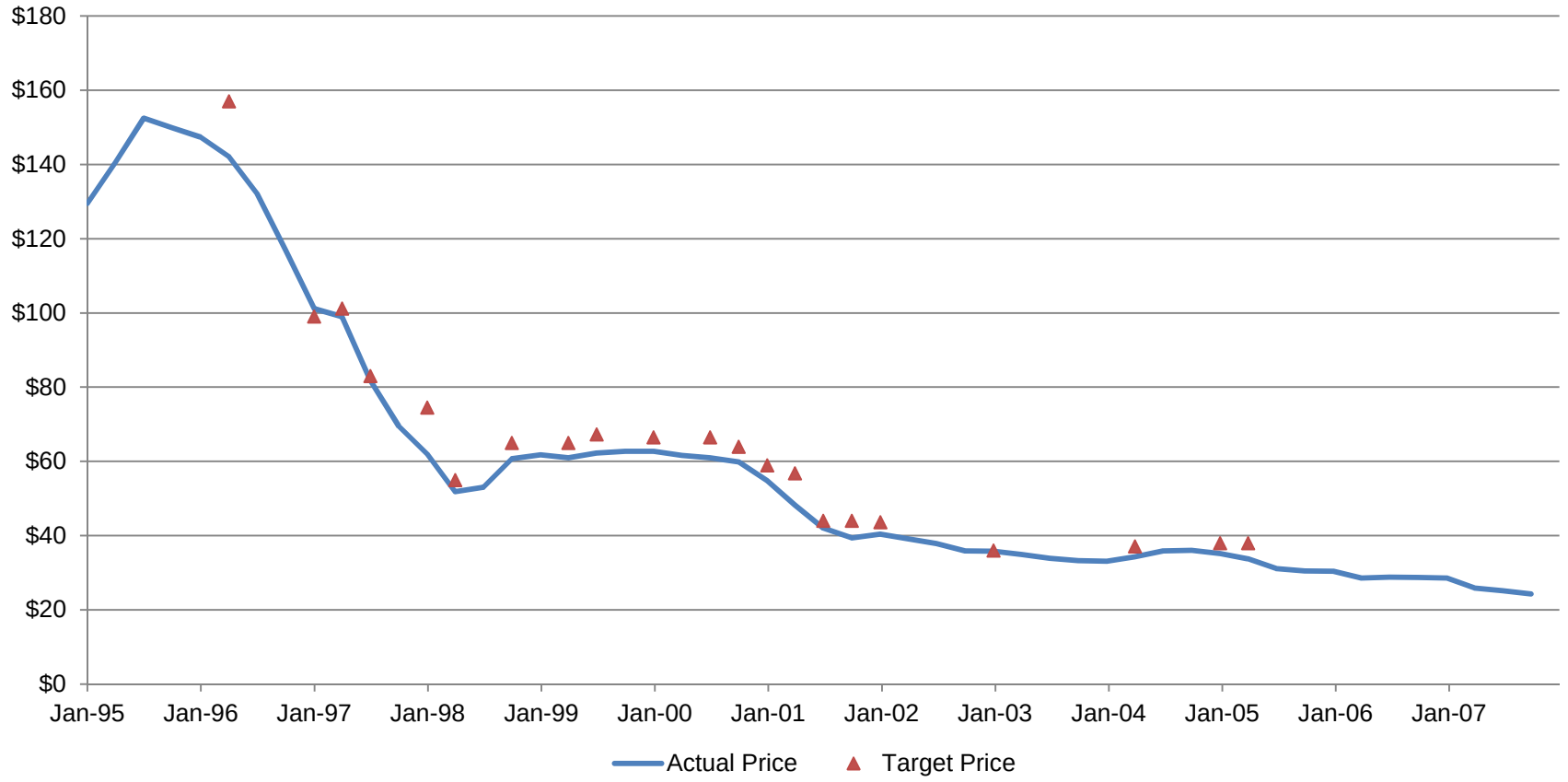
Meeting Date	Bates Number	Manufacturer	Type	Capacity Control	Production Control
9/14/2000	CHU00031044	Samsung	CDT		X
9/27/2000	CHU00031067	Chunghwa, LG, Orion, Philips, Samsung	CDT		X
10/25/2000	CHU00031075	Chunghwa, LG, Orion, Philips, Samsung	CDT		X
11/29/2000	SDCRT-0087393	Chunghwa, LG, Orion, Philips, Samsung	CDT		X
2/23/2001	SDCRT-0087405	Chunghwa, LG, Orion, Philips, Samsung	CDT		X
3/19/2001	CHU00031111	Chunghwa, LG, Philips, Samsung	CDT		X
4/19/2001	CHU00024554	Chunghwa, LG, Orion, Philips, Samsung	CDT		X
4/24/2001	SDCRT-0087340	Guangdong, Irico, LG, MTPD, Novel, Philips, SEG-Hitachi, Thomson	CPT		X
4/26/2001	CHU00006004	Chunghwa	CDT		X
6/27/2001	CHU00660306	Chunghwa, LPD, Orion, Samsung	CDT	X	X
7/5/2001	SDCRT-0087664	Orion, Philips, Thomson	CPT		X
7/24/2001	CHU00031150	Chunghwa, LG, Orion, Samsung	CDT		X
8/28/2001	CHU00660408	Chunghwa, LPD, Orion, Samsung	CDT	X	X
10/15/2001	SDCRT-0087427	Chunghwa, LPD, Orion, Samsung	CDT	X	X
11/20/2001	CHU00660337	Chunghwa, LPD, Orion, Samsung	CDT	X	
1/9/2002	SDCRT-0087741	Chunghwa	CPT and CDT	X	
2/25/2002	TSB-CRT-00041862	Samsung	CDT	X	
11/14/2002	CHU00660476	Chunghwa, LPD, Samsung	CDT	X	
11/28/2002	CHU00660487	Chunghwa, LPD, Samsung	CDT	X	
1/1/2003	CHU00031804	Chunghwa, LPD, Samsung	CDT	X	X
5/30/2003	CHU00660549	Chunghwa, LPD, Samsung	CDT	X	
6/17/2003	CHU00660561	Chunghwa, LPD, Samsung	CDT	X	
6/19/2003	CHU00660213	Chunghwa, LPD, Samsung	CDT	X	
7/29/2003	CHU00031190	LPD, Samsung	CDT	X	
8/28/2003	CHU00031194	Chunghwa, LPD, Samsung	CDT	X	
11/7/2003	SDCRT-0088826	Chunghwa, LPD, Samsung	CDT	X	
11/21/2003	SDCRT-0088635	LPD, Samsung, Thomson	CPT		X
12/5/2003	CHU00031214	Chunghwa, LPD, Samsung	CDT	X	
1/30/2004	CHU00031227	Chunghwa, LPD, Samsung	CDT	X	
3/2/2004	SDCRT-0090258	Chunghwa, LPD, Samsung	CDT	X	
8/18/2004	CHU00031272	Chunghwa, LPD, Samsung	CDT		X
10/13/2004	CHU00735299	Chunghwa, LPD, Samsung	CDT	X	
10/26/2004	SDCRT-0090339	Chunghwa, LPD, Samsung	CDT	X	
11/15/2004	CHU00578883	Chunghwa, LPD, Samsung	CDT	X	
11/30/2004	SDCRT-0090355	Chunghwa, LPD, Samsung	CDT		X

Meeting Date	Bates Number	Manufacturer	Type	Capacity Control	Production Control
1/19/2005	SDCRT-0091599	Chunghwa, LPD, Samsung	CDT	X	
2/9/2005	SDCRT-0091491	LPD, Samsung, Thomson	CPT		X
2/14/2005	CHU00735253	Chunghwa, LPD, Samsung	CDT	X	
2/24/2005	SDCRT-0091605	Chunghwa, LPD, Samsung	CDT	X	
3/29/2005	SDCRT-0091616	Chunghwa, LPD, Samsung	CDT	X	
4/26/2005	CHU00014204	Chunghwa, LPD, Samsung	CDT	X	
5/25/2005	SDCRT-0091643	Chunghwa, LPD, Samsung	CDT	X	
6/28/2005	SDCRT-0091661	Chunghwa, LPD, Samsung	CDT	X	
9/28/2005	CHU00014230	Chunghwa, LPD, Samsung	CDT	X	
3/13/2006	SDCRT-0091715	Chunghwa, LPD, Samsung	CDT	X	
11/21/2006	CHU00102752	MTPD	CPT		X

Cartel Agreements to Reduce CDT Capacity by Shutting Down Production Lines

Years	Description	Source(s)
2001 - 2002	In 2001, members of the cartel agreed "to stop the production of 30% of the current [CDT] production lines for one year in order to effectively decrease capacity and control prices." They planned a three-step process between July 2001 and September 2001. LPD agreed to shut down six lines, Samsung five lines, Chunghwa five lines, and Orion one and a half lines during this period.	Chunghwa Picture Tubes, LTD, 27 June 2001, Visitation Report, CHU00660306 - CHU00660311, at 0309E - 3010E.
	By the end of 2002, each cartel member had met or exceeded the agreed-upon number of line shutdowns.	Chunghwa Picture Tubes, LTD, 23 January 2002, Visitation Report, Main Topic: CDT Market Information Exchange and Price/Production Review, CHU00031180 - CHU00031181, at 1181E. Chunghwa Picture Tubes, LTD, 27 December 2002, Itinerary, CHU00660487 - CHU00660500, at 0495.
2003 - 2004	Cartel meeting notes from December 27, 2002 lay out the cartel's line shutdown plan for CDTs in 2003. LPD was to shut down two lines and add one for a net decline of one line by June 2003, Samsung was to shut down two lines by June 2003, and Chunghwa was to shut down one line by May 2003 and another by June 2003.	Chunghwa Picture Tubes, LTD, 27 December 2002, Itinerary, CHU00660487 - CHU00660500, at 0495.
	It took somewhat longer to shutter the agreed-upon number of lines: Slides from a December 5, 2003 meeting provide a chart that illustrates that LPD needed to shut down two lines, Samsung half a line, and Chunghwa no lines to fulfill previous agreements.	Yuan, 05 December 2003, CDT Market Report, CHU00031214 - CHU00031220, at 1219E.
	By September 2004 all cartel member had met their obligations, except for Samsung, which had only shutdown one of the promised two lines. The cartel rolled over Samsung's planned line shutdown to the 2005 plan discussed in the following section.	Chunghwa Picture Tubes, LTD, 21 September 2004, Itinerary, CHU00660728 - CHU00660735, at 0732.
2005 - 2006	In 2005, the cartel created a line shutdown plan calling for each of LPD, Samsung, and Chunghwa to shut down a CDT line in each of the first three quarters of 2005 for a total shut down of nine lines.	Samsung, June 2005, Agenda, SDCRT-0091661 - SDCRT-0091667, at 1666.
	Cartel meeting notes from February 2005 state that "each maker has stopped one production line since January".	Chunghwa Picture Tubes, LTD, 23 February 2005, Overseas Trip Report, CHU00608095 - CHU00608105, at 8095.01E.
	As of March 2006, Samsung needed to shut down one and a half lines to reach the total of three lines, while LPD and Chunghwa had shut down the necessary three lines to fulfill the cartel agreement.	Samsung SDI, 13 March 2006, Main Discussion Agenda, SDCRT-0091715 - SDCRT-0091718, at 1716E.

Price of 15-Inch CDTs



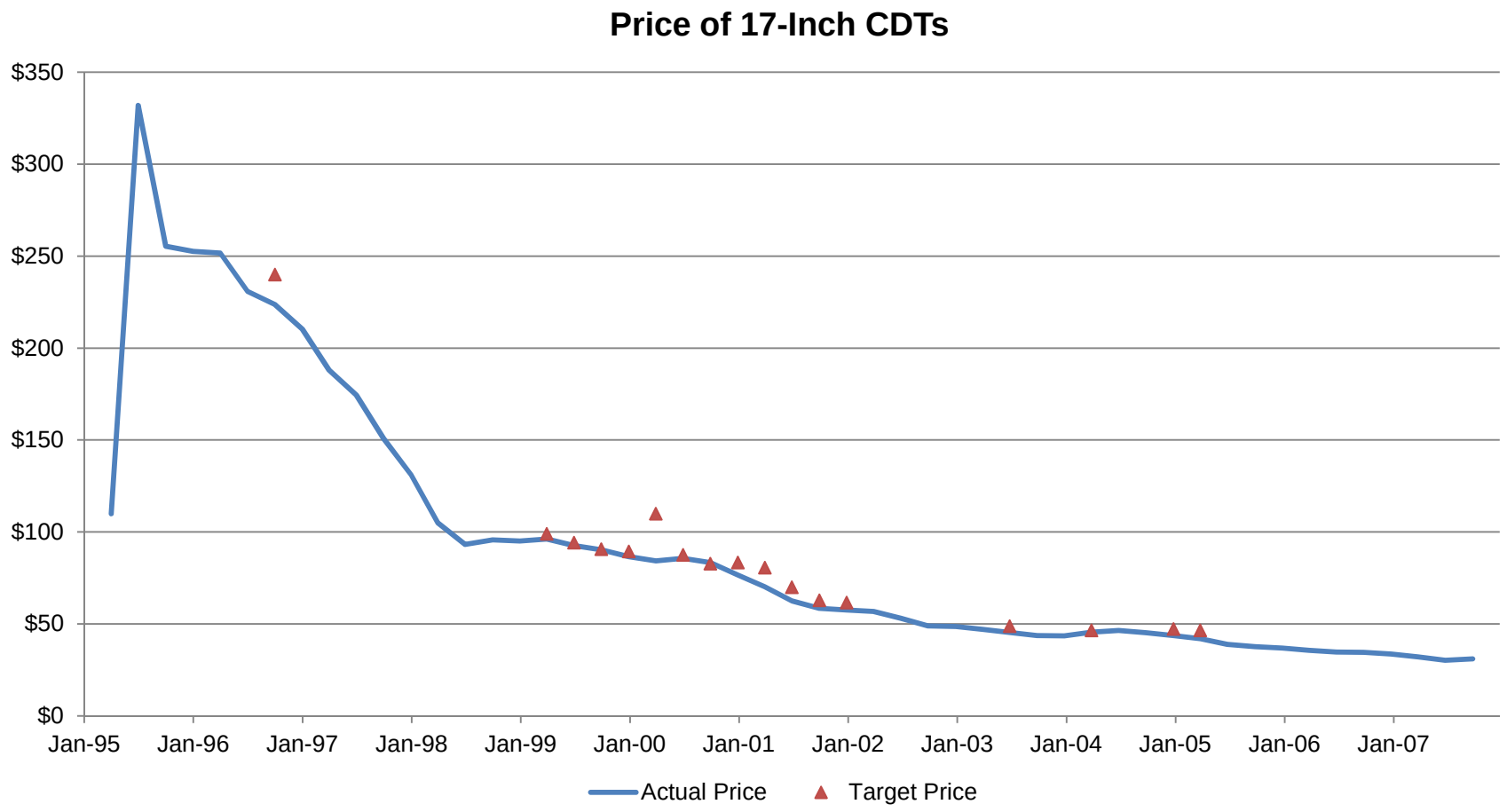
Note(s): Actual and target prices are quantity-weighted averages according to quantity sold in the Defendant data.

Data source(s): Defendant data; see Exhibit 64.

Cartel meeting notes; see Target price-structure.xlsx.

Source file(s): Target price-structure.xlsx; vendor_map.do; vendor_map.xlsx; PriceTracker.do; clean_target.do; clean_defendant.do; target_price_index.do; combine_target_defendant.do; data for graph exhibits.do; data for graph exhibits.xlsx

Exhibit 30



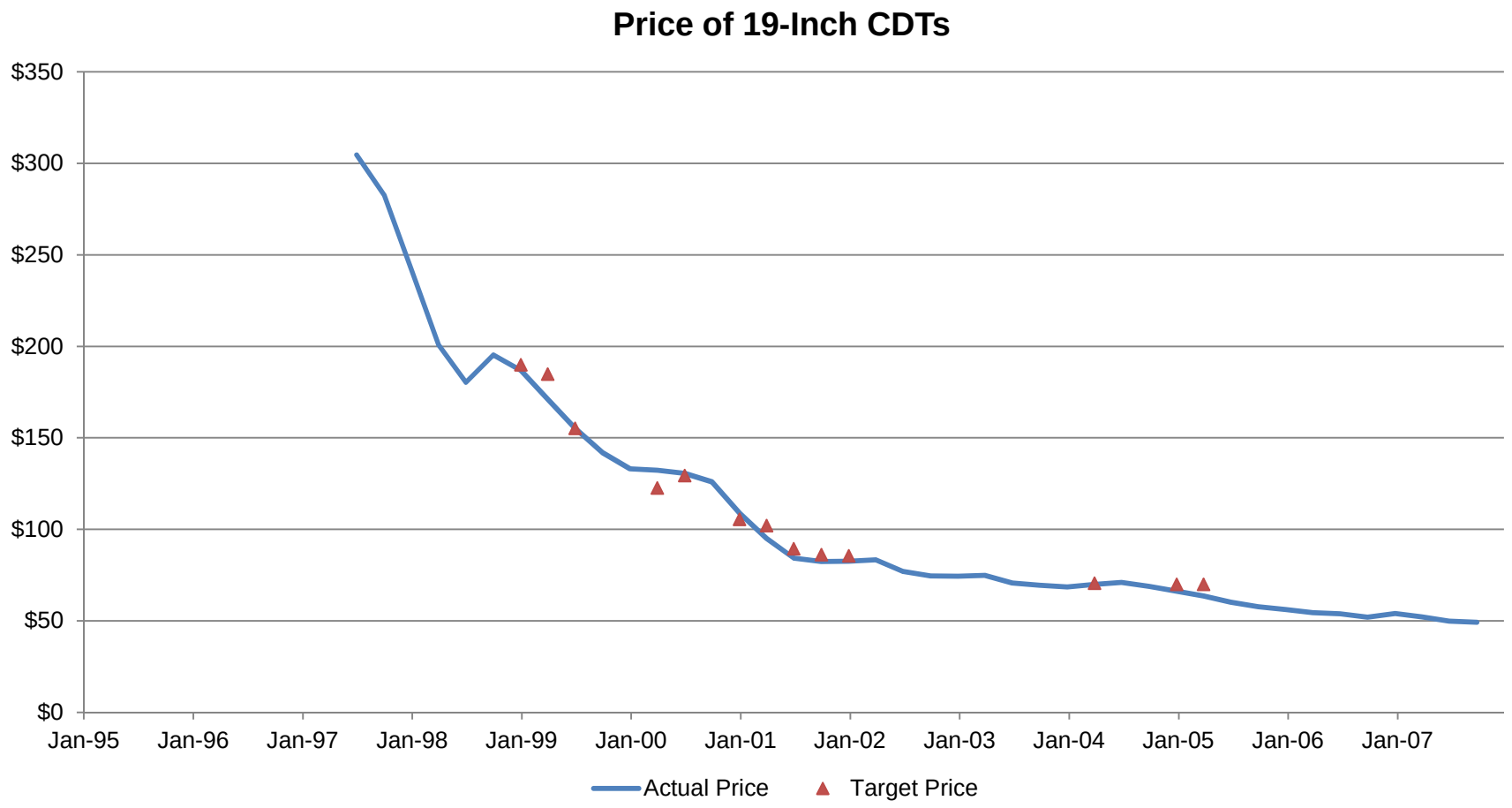
Note(s): Actual and target prices are quantity-weighted averages according to quantity sold in the Defendant data.

There is only one 17-inch CDT observation in Defendant data for 2Q 1995.

Data source(s): Defendant data; see Exhibit 64.

Cartel meeting notes; see Target price-structure.xlsx.

Source file(s): Target price-structure.xlsx; vendor_map.do; vendor_map.xlsx; PriceTracker.do; clean_target.do; clean_defendant.do; target_price_index.do; combine_target_defendant.do; data for graph exhibits.do; data for graph exhibits.xlsx



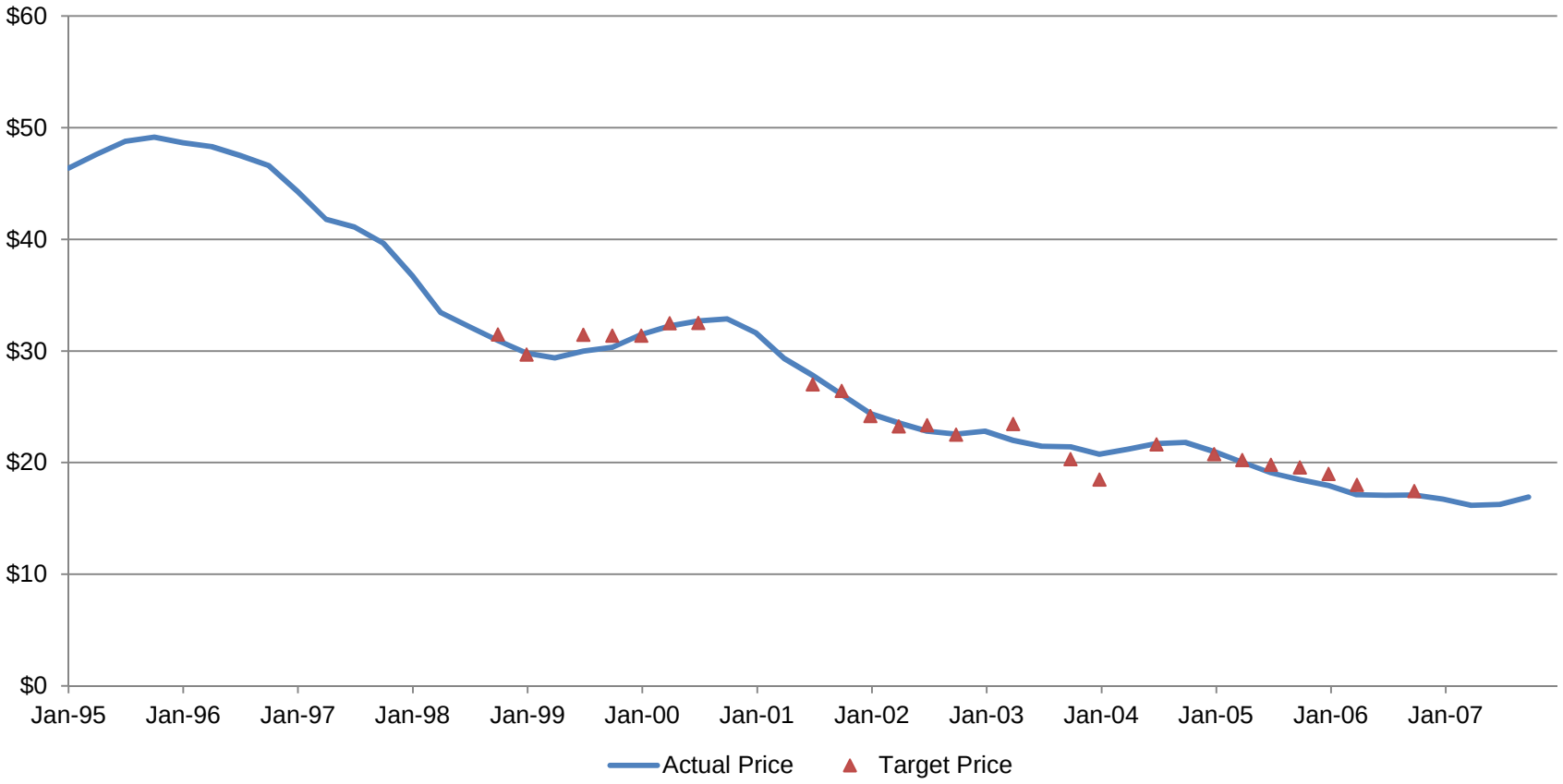
Note(s): Actual and target prices are quantity-weighted averages according to quantity sold in the Defendant data.

Data source(s): Defendant data; see Exhibit 64.

Cartel meeting notes; see Target price-structure.xlsx.

Source file(s): Target price-structure.xlsx; vendor_map.do; vendor_map.xlsx; PriceTracker.do; clean_target.do; clean_defendant.do; target_price_index.do; combine_target_defendant.do; data for graph exhibits.do; data for graph exhibits.xlsx

Price of 14-Inch CPTs

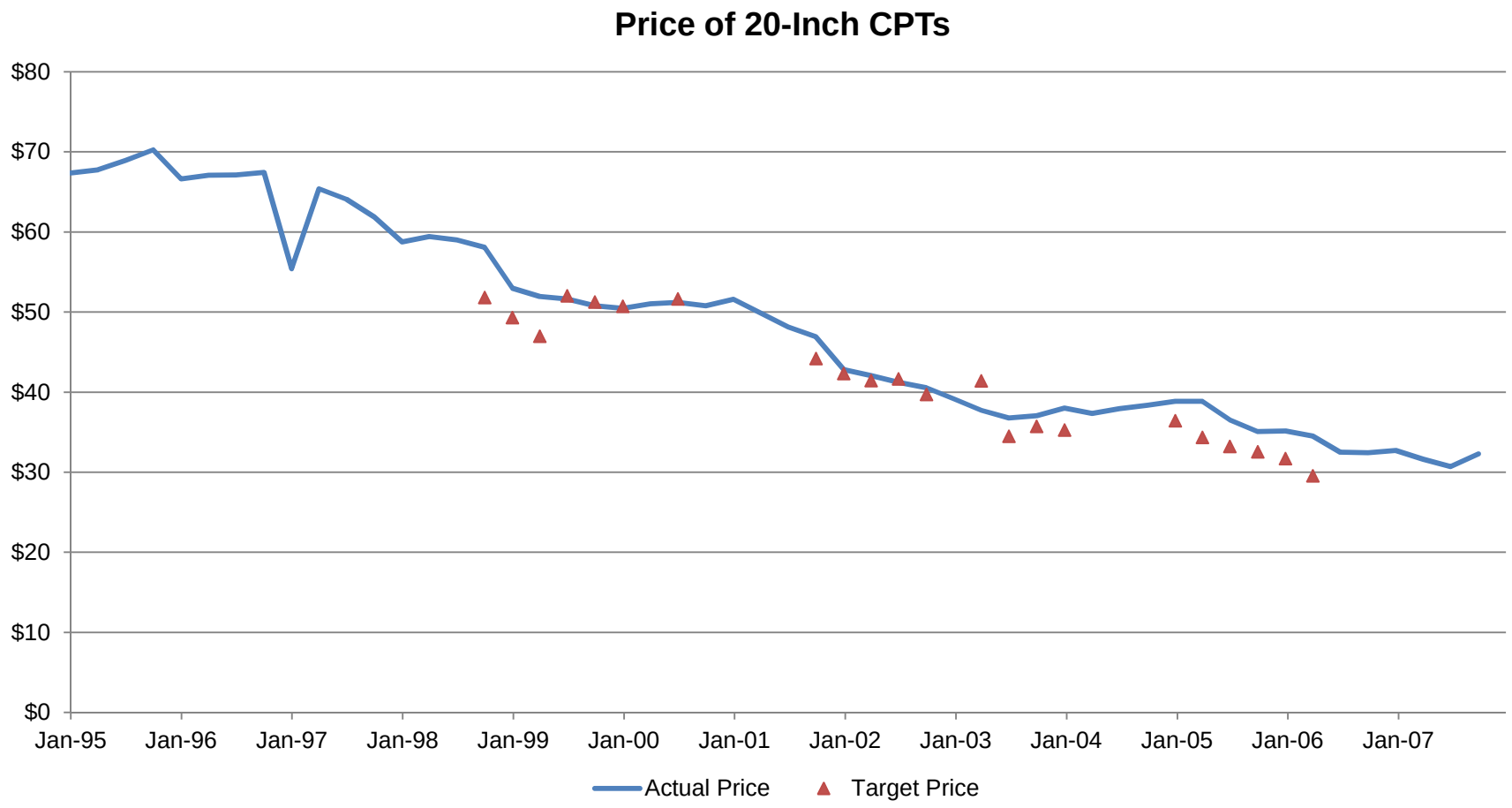


Note(s): Actual and target prices are quantity-weighted averages according to quantity sold in the Defendant data.

Data source(s): Defendant data; see Exhibit 64.

Cartel meeting notes; see Target price-structure.xlsx.

Source file(s): Target price-structure.xlsx; vendor_map.do; vendor_map.xlsx; PriceTracker.do; clean_target.do; clean_defendant.do; target_price_index.do; combine_target_defendant.do; data for graph exhibits.do; data for graph exhibits.xlsx

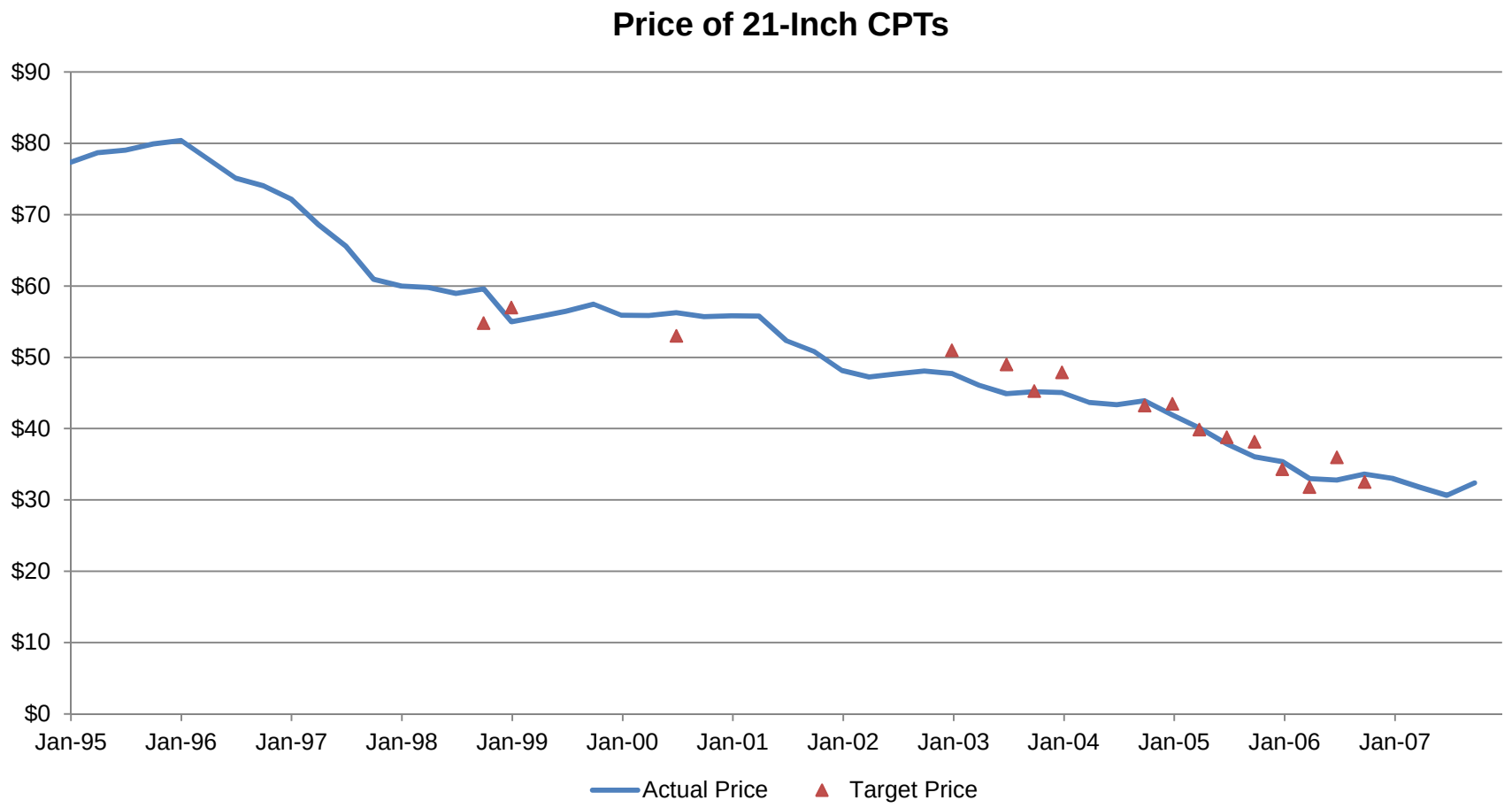


Note(s): Actual and target prices are quantity-weighted averages according to quantity sold in the Defendant data.

Data source(s): Defendant data; see Exhibit 64.

Cartel meeting notes; see Target price-structure.xlsx.

Source file(s): Target price-structure.xlsx; vendor_map.do; vendor_map.xlsx; PriceTracker.do; clean_target.do; clean_defendant.do; target_price_index.do; combine_target_defendant.do; data for graph exhibits.do; data for graph exhibits.xlsx

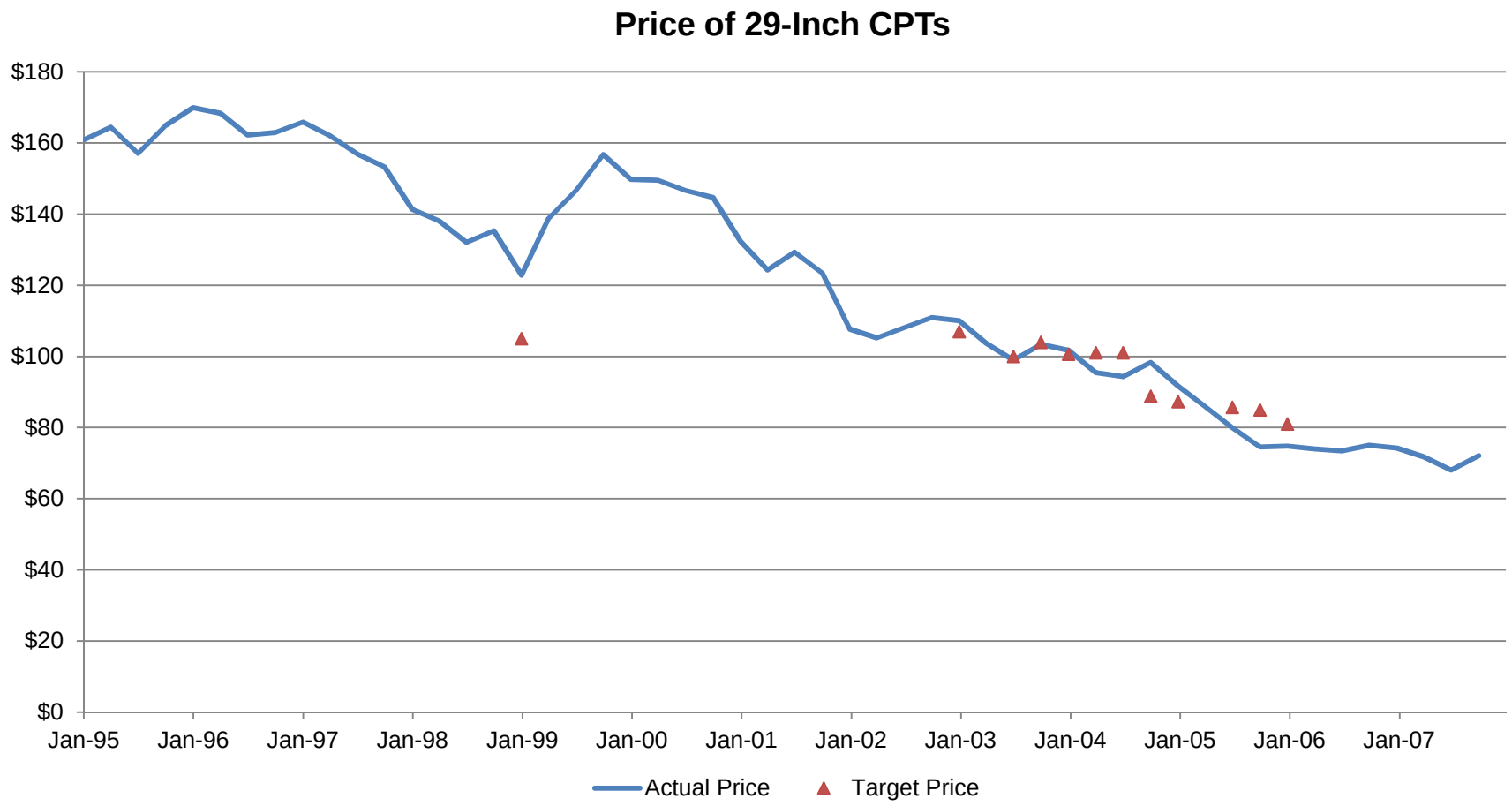


Note(s): Actual and target prices are quantity-weighted averages according to quantity sold in the Defendant data.

Data source(s): Defendant data; see Exhibit 64.

Cartel meeting notes; see Target price-structure.xlsx.

Source file(s): Target price-structure.xlsx; vendor_map.do; vendor_map.xlsx; PriceTracker.do; clean_target.do; clean_defendant.do; target_price_index.do; combine_target_defendant.do; data for graph exhibits.do; data for graph exhibits.xlsx



Note(s): Actual and target prices are quantity-weighted averages according to quantity sold in the Defendant data.

Data source(s): Defendant data; see Exhibit 64.

Cartel meeting notes; see Target price-structure.xlsx.

Source file(s): Target price-structure.xlsx; vendor_map.do; vendor_map.xlsx; PriceTracker.do; clean_target.do; clean_defendant.do; target_price_index.do; combine_target_defendant.do; data for graph exhibits.do; data for graph exhibits.xlsx

Target Price Regression Results - CDTs

Regression of Actual Prices on Target Prices

By Customer, Manufacturer, Size, and Finish

Dependant variable is Ln(Actual Price)

Variable	Coefficient	Standard Error	P-Value (two-sided)
Ln(Previous Quarter's price)	0.312	0.047	0.000
Ln(Target Price)	0.556	0.032	0.000
Ln(Price of Glass) × Size	0.018	0.004	0.000
Ln(Industrial Production)	0.556	0.125	0.000
Unemployment Rate	0.072	0.012	0.000
Constant	-3.917	0.698	0.000

Fixed Effects by customer, manufacturer, size, and finish

Number of observations	3,826
R-squared	0.84

Data Source(s): Organisation for Economic Co-operation and Development, 03 January 2014, Production and Sales (MEI): Production, OECD.StatExtracts, http://stats.oecd.org/index.aspx?queryid=90#, accessed 03 January 2014.

Organisation for Economic Co-operation and Development, 03 January 2014, Key Short-Term Economic Indicators: Harmonised Unemployment Rate, OECD.StatExtracts, http://stats.oecd.org/index.aspx?queryid=21760, accessed 03 January 2014.

Bank of Korea, Undated, Glass for CRT Use.

Defendant data; see Exhibit 64.

Cartel meeting notes; see Target price-structure.xlsx.

Source File(s): Target price-structure.xlsx; vendor_map.xlsx; vendor_map.do; PriceTracker.do; clean_target.do; clean_defendant.do; target_price_index.do; combine_target_defendant.do; target_price_regressions.do; target_regression_exhibits.do; target_regression_exhibits.xlsx

Target Price Regression Results - CPTs

Regression of Actual Prices on Target Prices

By Customer, Manufacturer, Size, and Finish

Dependant variable is Ln(Actual Price)

Variable	Coefficient	Standard Error	P-Value (two-sided)
Ln(Previous Quarter's price)	0.466	0.050	0.000
Ln(Target Price)	0.342	0.033	0.000
Ln(Price of Glass) × Size	0.006	0.001	0.000
Ln(Industrial Production)	-0.108	0.117	0.357
Unemployment Rate	-0.011	0.007	0.132
Constant	0.693	0.664	0.296

Fixed Effects by customer, manufacturer, size, and finish

Number of observations	6,046
R-squared	0.96

Data Source(s): Organisation for Economic Co-operation and Development, 03 January 2014, Production and Sales (MEI): Production, OECD.StatExtracts, http://stats.oecd.org/index.aspx?queryid=90#, accessed 03 January 2014.

Organisation for Economic Co-operation and Development, 03 January 2014, Key Short-Term Economic Indicators: Harmonised Unemployment Rate, OECD.StatExtracts, http://stats.oecd.org/index.aspx?queryid=21760, accessed 03 January 2014.

Bank of Korea, Undated, Glass for CRT Use.

Defendant data; see Exhibit 64.

Cartel meeting notes; see Target price-structure.xlsx.

Source File(s): Target price-structure.xlsx; vendor_map.xlsx; vendor_map.do; PriceTracker.do; clean_target.do; clean_defendant.do; target_price_index.do; combine_target_defendant.do; target_price_regressions.do; target_regression_exhibits.do; target_regression_exhibits.xlsx

Price Differentials Set by Cartel

Price Differential	High Price Condition	Low Price Condition	Size	Base Model Shape	Meeting Date	Effective Date	Bates Number
$2.00	ITC	B+D	14	Round	11/23/1996	11/23/1996	CHU00028786
$2.00	Other Manufacturers	Daewoo	14	Round	1/28/1997	2/1/1997	CHU00028768
$5.00	All Except Chunghwa	Chunghwa	15	Round	2/25/1997	4/1/1997	CHU00028760
$2.50	With Coil	Without Coil	15	Round	3/26/1997	4/1/1997	CHU00028746
$2.00	MPRII	ASC	14	Round	3/26/1997	4/1/1997	CHU00028746
$2.00	With Coil	Without Coil	15	Round	3/26/1997	4/1/1997	CHU00028746
$2.00	MPRII	ASC	15	Round	3/26/1997	4/1/1997	CHU00028746
$2.00	With Coil	Without Coil	14	Round	3/26/1997	4/1/1997	CHU00028746
$1.50	With Coil	Without Coil	14	Round	3/26/1997	4/1/1997	CHU00028746
$3.00	Samsung/Philips	Chunghwa	15	Round	5/20/1997	5/1/1997	CHU00028725
$3.00	Samsung/Philips	Chunghwa	15	Round	5/20/1997	6/1/1997	CHU00028725
$10.00	Short Length	Normal Length	19	Round	1/18/1999	1/18/1999	SDCRT-0086557
$10.00	Short Length	Normal Length	19	Round	3/8/1999	5/1/1999	SDCRT-0086563
$1.00	Standard Neck	Mini-neck	15	Round	6/23/1999	8/1/1999	CHU00030787
$2.00	External Customers	Internal Customers	14	Round	6/23/1999	8/1/1999	SDCRT-0086641
$2.00	Key Account	Internal Customers	15	Round	6/23/1999	8/1/1999	CHU00030787
$2.00	Customers Outside of China and not Internal	Internal Customers	14	Round	6/23/1999	9/1/1999	CHU00030787
$5.00	.26mm	.28mm	19	Round	7/28/1999	7/28/1999	CHU00030807
$3.00	Daewoo	Chunghwa	19	Round	8/10/1999	8/10/1999	CHU00030831
$3.00	LPD	Chunghwa	19	Round	8/10/1999	8/10/1999	CHU00030831
$3.00	Samsung	Chunghwa	19	Round	8/10/1999	8/10/1999	CHU00030831
$3.50	ITC	Bare	14	Round	8/23/1999	4/1/1999	CHU00029179
$3.50	ITC	Bare	14	Round	8/23/1999	7/1/1999	CHU00029179
$4.50	ITC	Bare	20	Round	8/23/1999	7/1/1999	CHU00029179
$4.50	ITC	Bare	20	Round	8/23/1999	4/1/1999	CHU00029179
$1.00	Normal	Mini-neck	15	Round	9/20/1999	9/20/1999	CHU00030855
$1.00	LPD	Irico	14	Round	10/11/1999	1/1/2000	CHU00029046
$0.30	Arrival	CIF	14	Round	1/24/2000	1/1/2000	CHU00029152
$4.50	ITC	Bare	20	Round	1/24/2000	1/1/2000	CHU00029152
$0.30	Arrival	CIF	20	Round	1/24/2000	10/1/2000	CHU00029152
$3.50	ITC	Bare	14	Round	1/24/2000	10/1/2000	CHU00029152
$4.50	ITC	Bare	20	Round	1/24/2000	10/1/2000	CHU00029152
$0.30	Arrival	CIF	20	Round	1/24/2000	1/1/2000	CHU00029152
$0.30	Arrival	CIF	14	Round	1/24/2000	10/1/2000	CHU00029152
$3.50	ITC	Bare	14	Round	1/24/2000	1/1/2000	CHU00029152
$4.00	Mini-neck	Normal (Bare)	20	Round	3/7/2000	7/1/2000	CHU00029147

Price Differential	High Price Condition	Low Price Condition	Size	Base Model Shape	Meeting Date	Effective Date	Bates Number
$4.00	Mini-neck	Bare	20	Round	3/24/2000	7/1/2000	CHU00029144
$4.50	ITC	Bare	20	Round	3/24/2000	7/1/2000	CHU00029144
$0.30	Arrival	CIF	20	Round	3/24/2000	7/1/2000	CHU00029144
$0.30	Arrival	CIF	14	Round	3/24/2000	5/1/2000	CHU00029144
$3.50	ITC	Bare	14	Round	3/24/2000	5/1/2000	CHU00029144
$2.00	95KHz	85KHz	19	Round	5/26/2000	7/1/2000	CHU00031006
$2.00	.25mm	.27mm	19	Round	5/26/2000	7/1/2000	CHU00031006
$3.00	TCO	MPRII	19	Round	5/26/2000	7/1/2000	CHU00031006
$1.00	Non-Key Account	Key Account	15	Round	6/9/2000	7/1/2000	CHU00028209
$1.00	Non-Key Account	Key Account	17	Round	6/9/2000	7/1/2000	CHU00028209
$1.00	Non-Key Account	Key Account	14	Round	6/9/2000	7/1/2000	CHU00028209
$1.00	Mini-neck	Normal	15	Round	9/21/2000	9/21/2000	CHU00031051
$2.00	Chunghwa	Irico	14	Round	2/15/2001	2/15/2001	CHU00031101
$2.00	ITC	Non ITC	19	Round	12/28/2001	2/1/2002	CHU00031174
$2.00	TCO	MPRII	19	Round	12/28/2001	2/1/2002	CHU00031174
$1.50	ITC	Non ITC	17	Flat	12/28/2001	2/1/2002	CHU00031174
$2.00	95KHz	85KHz	19	Round	12/28/2001	2/1/2002	CHU00031174
$1.00	ITC	Non ITC	15	Round	12/28/2001	2/1/2002	CHU00031174
$1.00	TCO	MPRII	17	Flat	12/28/2001	2/1/2002	CHU00031174
$1.00	TCO	MPRII	17	Round	12/28/2001	2/1/2002	CHU00031174
$1.50	ITC	Non ITC	17	Round	12/28/2001	2/1/2002	CHU00031174
$1.00	Other Customers	Lite-on	17	Flat	1/29/2002	2/1/2002	TAEC-CRT-00089968
$1.00	Other Customers	AOC	17	Round	1/29/2002	2/1/2002	TAEC-CRT-00089968
$1.00	Other Customers	Big Accounts	17	Round	1/29/2002	2/1/2002	TAEC-CRT-00089968
$2.00	Other Customers	Internal Customers	15	Round	1/29/2002	2/1/2002	TAEC-CRT-00089968
$2.00	Other Customers	Internal Customers	17	Flat	1/29/2002	2/1/2002	TAEC-CRT-00089968
$1.00	Other Customers	BenQ	17	Round	1/29/2002	2/1/2002	TAEC-CRT-00089968
$2.00	Other Customers	Internal Customers	17	Round	1/29/2002	2/1/2002	TAEC-CRT-00089968
$1.00	Other Customers	AOC	15	Round	1/29/2002	2/1/2002	TAEC-CRT-00089968
$1.00	Other Customers	AOC	17	Flat	1/29/2002	2/1/2002	TAEC-CRT-00089968
$1.00	Other Customers	Big Accounts	15	Round	1/29/2002	2/1/2002	TAEC-CRT-00089968
$1.00	Other Customers	BenQ	17	Flat	1/29/2002	2/1/2002	TAEC-CRT-00089968
$1.00	Other Customers	BenQ	15	Round	1/29/2002	2/1/2002	TAEC-CRT-00089968
$1.00	Other Customers	Big Accounts	17	Flat	1/29/2002	2/1/2002	TAEC-CRT-00089968
$1.00	Other Customers	Lite-on	15	Round	1/29/2002	2/1/2002	TAEC-CRT-00089968
$1.00	Other Customers	Lite-on	17	Round	1/29/2002	2/1/2002	TAEC-CRT-00089968
$1.00	ITC	Non ITC	17	Round	9/24/2003	10/1/2003	CHU00031202
$6.50	B+D	Bare	17	Round	9/24/2003	9/24/2003	CHU00031202
$6.50	B+D	Bare	17	Round	9/24/2003	9/1/2003	CHU00031202

Price Differential	High Price Condition	Low Price Condition	Size	Base Model Shape	Meeting Date	Effective Date	Bates Number
$1.00	ITC	Non ITC	17	Round	10/29/2003	1/1/2004	SDCRT-0088819
$1.50	Higher Frequency	Lower Frequency	19	Flat	10/29/2003	1/1/2004	SDCRT-0088819
$1.50	ITC	Non ITC	19	Round	10/29/2003	1/1/2004	SDCRT-0088819
$0.75	MPR	Glare	17	Round	10/29/2003	1/1/2004	SDCRT-0088819
$0.75	MPR	Glare	15	Round	10/29/2003	1/1/2004	SDCRT-0088819
$1.00	TCO	MPR	19	Round	10/29/2003	1/1/2004	SDCRT-0088819
$0.75	MPR	Glare	19	Round	10/29/2003	1/1/2004	SDCRT-0088819
$0.50	TCO	MPR	17	Round	10/29/2003	1/1/2004	SDCRT-0088819
$0.50	ITC	Non ITC	17	Flat	11/26/2003	1/1/2004	CHU00031214
$0.50	TCO	MPRII	17	Round	11/26/2003	1/1/2004	CHU00031214
$1.00 - $2.50	MPRII	Glare/Anti-glare	17	Flat	11/26/2003	1/1/2004	CHU00031214
$1.00 - $1.50	MPRII	Glare/Anti-glare	15	Round	11/26/2003	1/1/2004	CHU00031214
$1.00	ITC	Non ITC	17	Flat	11/26/2003	1/1/2004	CHU00031214
$0.50	ITC	Non ITC	15	Round	11/26/2003	1/1/2004	CHU00031214
$1.00	TCO	MPRII	19	Flat	11/26/2003	1/1/2004	CHU00031214
$1.00	TCO	MPRII	19	Round	11/26/2003	1/1/2004	CHU00031214
$1.50	ITC	Non ITC	19	Flat	11/26/2003	1/1/2004	CHU00031214
$1.00 - $2.50	MPRII	Glare/Anti-glare	17	Round	11/26/2003	1/1/2004	CHU00031214
$0.50	TCO	MPRII	17	Flat	11/26/2003	1/1/2004	CHU00031214
$1.00	57KHz	48KHz	15	Round	11/26/2003	1/1/2004	CHU00031214
$9.00	ITC	Bare	25	Flat	11/28/2003	10/1/2003	MTPD-0580726
$9.00	ITC	Bare	29	Flat	11/28/2003	10/1/2003	MTPD-0580726
$5.00	ITC	Bare	21	Flat	11/28/2003	7/1/2003	MTPD-0580726
$9.00	ITC	Bare	29	Flat	11/28/2003	7/1/2003	MTPD-0580726
$9.00	ITC	Bare	25	Flat	11/28/2003	7/1/2003	MTPD-0580726
$5.00	ITC	Bare	21	Flat	11/28/2003	10/1/2003	MTPD-0580726
$6.04	LPD	Samsung	32	Flat	12/4/2003	1/1/2004	SDCRT-0088661
$6.04	External Customers	Internal Customers	32	Flat	12/4/2003	1/1/2004	SDCRT-0088661
$1.00	TCO	MPRII	19	Flat	3/25/2004	4/1/2004	CHU00031240
$0.50 - $1.00	MPRII	Glare/Anti-glare	17	Flat	3/25/2004	4/1/2004	CHU00031240
$0.50 - $1.00	MPRII	Glare/Anti-glare	17	Round	3/25/2004	4/1/2004	CHU00031240
$0.50	ITC	Non ITC	17	Round	3/25/2004	4/1/2004	CHU00031240
$1.50	ITC	Non ITC	15	Round	3/25/2004	4/1/2004	CHU00031240
$1.50	ITC	Non ITC	19	Flat	3/25/2004	4/1/2004	CHU00031240
$0.50 - $1.00	MPRII	Glare/Anti-glare	15	Round	3/25/2004	4/1/2004	CHU00031240
$1.00	ITC	Non ITC	19	Round	3/25/2004	4/1/2004	CHU00031240
$1.00	TCO	MPRII	15	Round	3/25/2004	4/1/2004	CHU00031240
$0.50	TCO	MPRII	19	Round	3/25/2004	4/1/2004	CHU00031240
$0.50	TCO	MPRII	17	Flat	3/25/2004	4/1/2004	CHU00031240

Price Differential	High Price Condition	Low Price Condition	Size	Base Model Shape	Meeting Date	Effective Date	Bates Number
$1.00	57KHZ	48KHZ	19	Round	3/25/2004	4/1/2004	CHU00031240
$1.50	95KHz	85KHz	19	Flat	3/25/2004	4/1/2004	CHU00031240
$1.00	ITC	Non ITC	17	Flat	3/25/2004	4/1/2004	CHU00031240
$0.50	Other Customers	AOC	15	Round	4/26/2004	4/1/2004	CHU00660681
$0.50	ITC	Non ITC	15	Round	4/26/2004	4/1/2004	CHU00660681
$0.50	Other Customers	Lite-on	19	Round	4/26/2004	4/1/2004	CHU00660681
$0.50	Other Customers	Lite-on	17	Round	4/26/2004	4/1/2004	CHU00660681
$0.50	Other Customers	Lite-on	15	Round	4/26/2004	4/1/2004	CHU00660681
$0.50	TCO	MPRII	17	Round	4/26/2004	4/1/2004	CHU00660681
$1.00	ITC	Non ITC	17	Round	4/26/2004	4/1/2004	CHU00660681
$1.00	57KHZ	48KHZ	15	Round	4/26/2004	4/1/2004	CHU00660681
$1.00	TCO	MPRII	19	Round	4/26/2004	4/1/2004	CHU00660681
$0.50	Other Customers	LPD	15	Round	4/26/2004	4/1/2004	CHU00660681
$1.50	ITC	Non ITC	19	Round	4/26/2004	4/1/2004	CHU00660681
$0.50	Other Customers	LPD	19	Round	4/26/2004	4/1/2004	CHU00660681
$0.50	Other Customers	SEC	19	Round	4/26/2004	4/1/2004	CHU00660681
$0.50	Other Customers	SEC	17	Round	4/26/2004	4/1/2004	CHU00660681
$0.50	Other Customers	AOC	17	Round	4/26/2004	4/1/2004	CHU00660681
$0.50	Other Customers	EMC	15	Round	4/26/2004	4/1/2004	CHU00660681
$0.50	Other Customers	SEC	15	Round	4/26/2004	4/1/2004	CHU00660681
$0.50	Other Customers	EMC	17	Round	4/26/2004	4/1/2004	CHU00660681
$1.50	95KHz	85KHz	19	Round	4/26/2004	4/1/2004	CHU00660681
$0.50	Other Customers	LPD	17	Round	4/26/2004	4/1/2004	CHU00660681
$0.50	Other Customers	EMC	19	Round	4/26/2004	4/1/2004	CHU00660681
$0.50	Other Customers	AOC	19	Round	4/26/2004	4/1/2004	CHU00660681
$6.50	B+D	Bare	17	Round	9/3/2004	10/1/2004	CHU00660728
$7.00	B+D	Bare	17	Flat	9/3/2004	10/1/2004	CHU00660728
$6.00	B+D	Bare	15	Round	9/3/2004	10/1/2004	CHU00660728
$1.50	Invar Mask	AK Mask	21	Flat	9/13/2004	10/1/2004	MTPD-0483335
$6.50	B+D	Bare	17	Flat	9/20/2004	10/1/2005	CHU00732831
$6.50	B+D	Bare	17	Round	9/20/2004	10/1/2005	CHU00732831
$5.50	B+D	Bare	15	Round	9/20/2004	10/1/2005	CHU00732831
$4.00	ITC	Bare	20	Round	12/28/2004	1/1/2005	SDCRT-0090210
$4.00	ITC	Bare	21	Round	12/28/2004	1/1/2005	SDCRT-0090210
$2.50	ITC	Bare	14	Round	12/28/2004	1/1/2005	SDCRT-0090210
$5.00	ITC	Bare	21	Flat	12/28/2004	1/1/2005	SDCRT-0090210
$3.50	ITC	Bare	21	Round	6/9/2005	4/1/2005	SDCRT-0091374
$4.50	ITC	Bare	21	Flat	6/9/2005	4/1/2005	SDCRT-0091374
$2.30	ITC	Bare	14	Round	6/9/2005	4/1/2005	SDCRT-0091374

Price Differential	High Price Condition	Low Price Condition	Size	Base Model Shape	Meeting Date	Effective Date	Bates Number
$3.50	ITC	Bare	21	Round	6/9/2005	7/1/2005	CHU00029971
$2.30	ITC	Bare	14	Round	6/9/2005	7/1/2005	CHU00029971
$3.00	ITC	Bare	20	Round	6/9/2005	4/1/2005	SDCRT-0091374
$3.00	ITC	Bare	20	Round	6/9/2005	7/1/2005	CHU00029971
$4.50	ITC	Bare	21	Flat	6/9/2005	7/1/2005	CHU00029971
$3.00	Invar Mask	AK Mask	29	Flat	6/30/2005	7/1/2005	MTPD-0517933
$3.00	ITC	Bare	20	Round	9/22/2005	10/1/2005	CHU00548418
$3.50	ITC	Bare	21	Round	9/22/2005	10/1/2005	CHU00548418
$4.00	ITC	Bare	21	Flat	9/22/2005	10/1/2005	CHU00548418
$2.30	ITC	Bare	14	Round	9/22/2005	10/1/2005	CHU00548418
$4.00	ITC	Bare	21	Flat	10/21/2005	1/1/2006	MTPD-0343949
$2.30	ITC	Bare	14	Round	12/6/2005	1/1/2006	SDCRT-0091400
$3.50	ITC	Bare	21	Round	12/6/2005	1/1/2006	SDCRT-0091400
$3.00	ITC	Bare	20	Round	12/6/2005	1/1/2006	SDCRT-0091400
$4.00	ITC	Bare	21	Round	12/6/2005	1/1/2006	SDCRT-0091400
$1.00	Invar Mask	AK Mask	15	Flat	12/12/2005	1/1/2006	MTPD-0580821
$4.00	ITC	Bare	21	Flat	3/9/2006	4/1/2006	CHU00124103
$3.50	ITC	Bare	21	Round	3/9/2006	4/1/2006	CHU00124103
$2.30	ITC	Bare	14	Round	3/9/2006	4/1/2006	CHU00124103
$3.00	ITC	Bare	20	Round	3/9/2006	4/1/2006	CHU00124103

Note(s):

The Meeting Date is the date that the cartel set the price differential or reviewed a previously-set price differential. The Effective Date is the date that the cartel planned to implement the price differential.

Bare, ITC, N-ITC (Non-ITC), and B+D are related to deflection yokes. B+D and N-ITC both refer to situations where the deflection yoke is shipped with the CRT but not pinned to it.

ASC means "Anti-Static & Silica Coating".

MPRII and TCO are safety standards for monitors.

Short Length, Normal Length, Standard Neck, and Mini-neck are related to CRT neck length.

Invar mask and AK mask are different mask types.

.25mm, .26mm, .27mm, and .28mm are dot pitches (related to resolution).

48kHz, 57kHz, 85kHz, 95kHz, Lower Frequency, and Higher Frequency are related to the horizontal scanning frequencies of monitors (the rate at which the electron gun scans rows on the display).

Coils are components of electron guns.

Arrival and CIF are terms of shipment.

Source File(s):

Target price-structure.xlsx

CDT Hedonic Regression Results

Dependant variable is Ln(Actual Price)

Variable	Coefficient	Standard Error	P-Value (two-sided)
Time trend	-0.043	0.001	0.000
Time trend squared	0.000	0.000	0.000
12-inch tube	-0.758	0.037	0.000
14-inch tube	-1.092	0.020	0.000
15-inch tube	-0.822	0.020	0.000
16-inch tube	-0.701	0.030	0.000
17-inch tube	-0.465	0.020	0.000
19-inch tube	-0.078	0.020	0.000
20-inch tube	-0.059	0.029	0.039
21-inch tube	0.553	0.021	0.000
24-inch tube	-0.016	0.036	0.660
ITC	0.176	0.011	0.000
Knock-down	0.062	0.011	0.000
Constant	5.870	0.029	0.000

Controlling for buyer-seller pairs	Yes
Number of observations	33,168
R-squared	0.91

Note(s):

Dependant variable is log(price). Coefficients for buyer-seller pairs are omitted.

Data Source(s):

Defendant data; see Exhibit 64.

Source File(s):

defendant_data_hedonics_merits.do

all_defendants_price.do

hedonics_results.xlsx

CPT Hedonic Regression Results

Dependant variable is Ln(Actual Price)

Variable	Coefficient	Standard Error	P-Value (two-sided)
Time trend	0.000	0.001	0.428
Time trend squared	0.000	0.000	0.000
11-inch tube	-0.217	0.034	0.000
14-inch tube	-0.548	0.007	0.000
15-inch tube	-0.188	0.008	0.000
16-inch tube	-0.072	0.011	0.000
17-inch tube	-0.007	0.010	0.503
19-inch tube	0.128	0.023	0.000
20-inch tube	-0.058	0.007	0.000
21-inch tube	0.090	0.007	0.000
24-inch tube	0.243	0.025	0.000
25-inch tube	0.582	0.007	0.000
26-inch tube	0.563	0.009	0.000
27-inch tube	0.816	0.018	0.000
28-inch tube	0.611	0.013	0.000
29-inch tube	0.876	0.007	0.000
32-inch tube	1.299	0.014	0.000
33-inch tube	1.784	0.016	0.000
34-inch tube	1.557	0.008	0.000
36-inch tube	1.824	0.015	0.000
38-inch tube	1.982	0.012	0.000
ITC	0.079	0.003	0.000
Knock-down	0.010	0.006	0.070
Widescreen	0.305	0.012	0.000
Constant	4.125	0.019	0.000

Controlling for buyer-seller pairs	Yes
Number of observations	62,026
R-squared	0.97

Note(s):

Dependant variable is log(price). Coefficients for buyer-seller pairs are omitted.

Data Source(s):

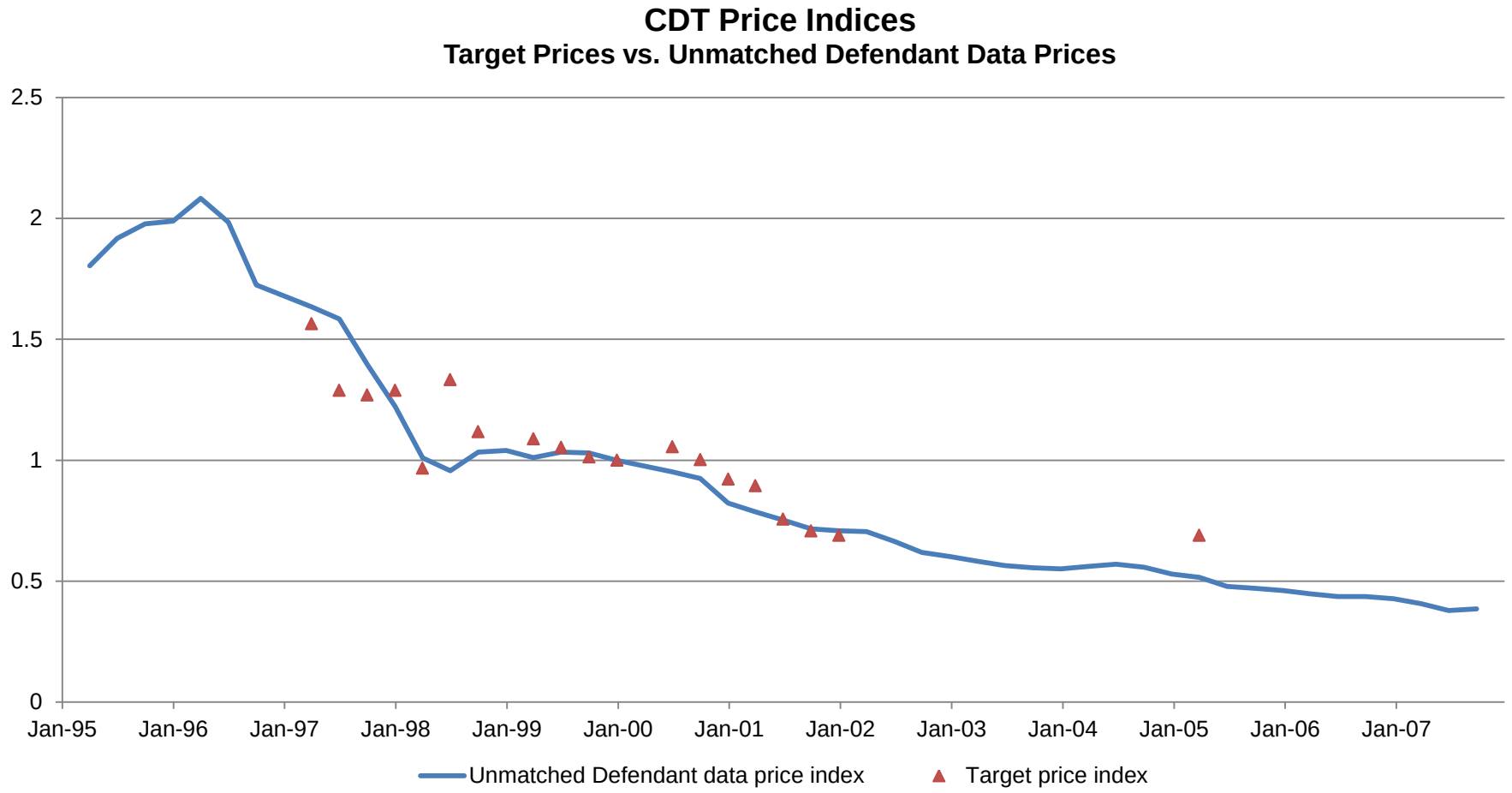
Defendant data; see Exhibit 64.

Source File(s):

defendant_data_hedonics_merits.do

all_defendants_price.do

hedonics_results.xlsx

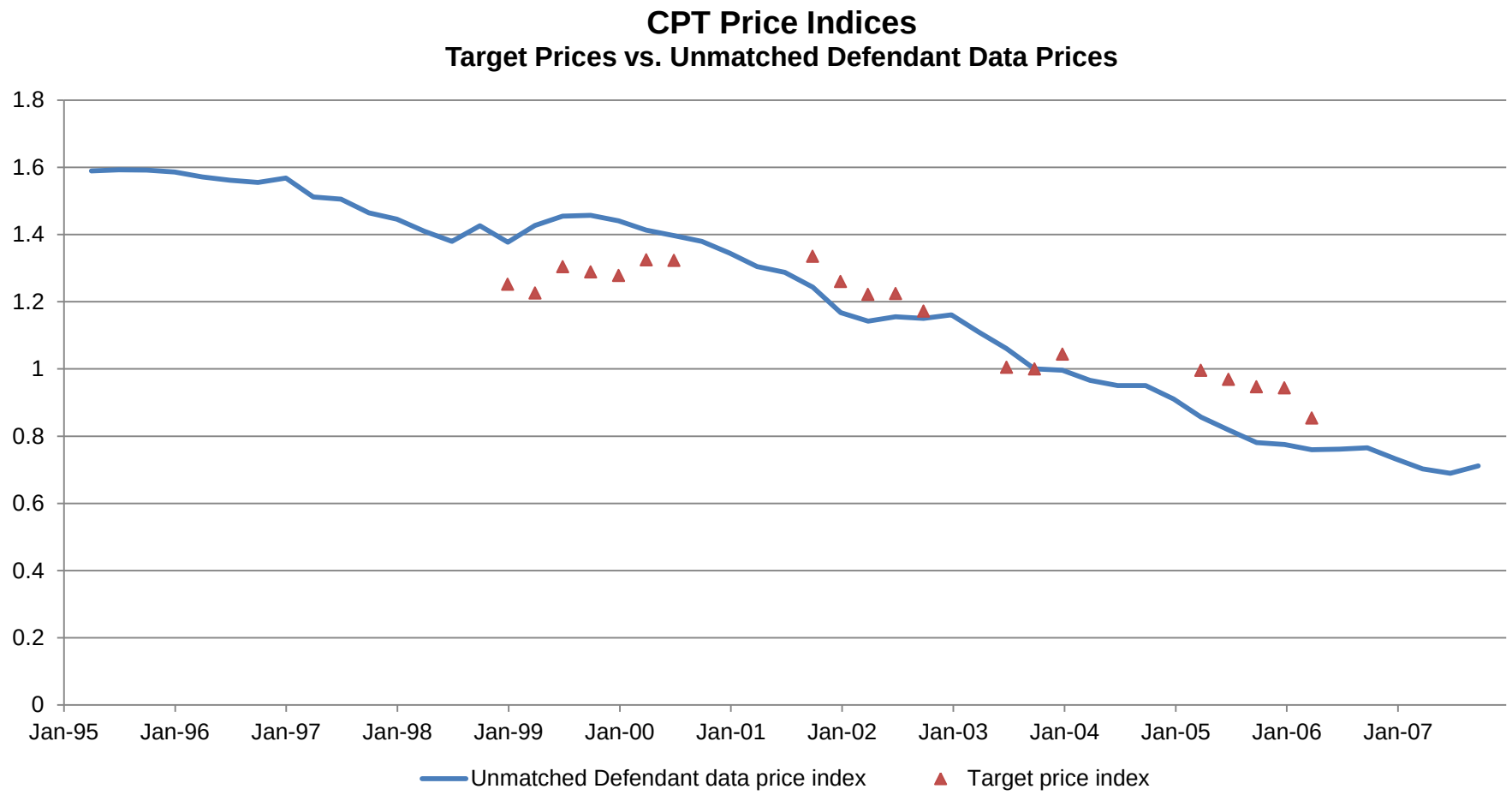


Note(s): Prices are quantity-weighted averages from Defendant data. Base period for both indices is 2000Q1.

Data source(s): Defendant data; see Exhibit 64.

Cartel meeting notes; see Target price-structure.xlsx.

Source file(s): Target price-structure.xlsx; vendor_map.xlsx; vendor_map.do; PriceTracker.do; clean_target.do; clean_defendant.do; target_price_index.do; actual_price_index.do; target_regression_exhibits.xlsx



Note(s): Prices are quantity-weighted averages from Defendant data. Base period for both indices is 2002Q1.

Data source(s): Defendant data; see Exhibit 64.

Cartel meeting notes; see Target price-structure.xlsx.

Source file(s): Target price-structure.xlsx; vendor_map.xlsx; vendor_map.do; PriceTracker.do; clean_target.do; clean_defendant.do; target_price_index.do; actual_price_index.do; target_regression_exhibits.xlsx

Target Price Index Regression Results - CDTs

Regression of Actual Prices on Target Price Index

By Customer, Manufacturer, Size, and Finish

Dependant variable is Ln(Actual Price)

Variable	Coefficient	Standard Error	P-Value (two-sided)
Ln(Previous Quarter's price)	0.504	0.031	0.000
Ln(Target Price Index)	0.298	0.019	0.000
Ln(Price of Glass) × Size	0.026	0.003	0.000
Ln(Industrial Production)	0.746	0.146	0.000
Unemployment Rate	0.085	0.015	0.000
Constant	-3.686	0.803	0.000

Fixed Effects by customer, manufacturer, size, and finish

Number of observations	5,955
R-squared	0.82

Data Source(s): Organisation for Economic Co-operation and Development, 03 January 2014, Production and Sales (MEI): Production, OECD.StatExtracts, http://stats.oecd.org/index.aspx?queryid=90#, accessed 03 January 2014.

Organisation for Economic Co-operation and Development, 03 January 2014, Key Short-Term Economic Indicators: Harmonised Unemployment Rate, OECD.StatExtracts, http://stats.oecd.org/index.aspx?queryid=21760, accessed 03 January 2014.

Bank of Korea, Undated, Glass for CRT Use.

Defendant data; see Exhibit 64.

Cartel meeting notes; see Target price-structure.xlsx.

Source File(s): Target price-structure.xlsx; vendor_map.xlsx; vendor_map.do; PriceTracker.do; clean_target.do; clean_defendant.do; target_price_index.do; combine_target_defendant.do; target_price_regressions.do; target_regression_exhibits.do; target_regression_exhibits.xlsx

Target Price Index Regression Results - CPTs

Regression of Actual Prices on Target Price Index

By Customer, Manufacturer, Size, and Finish

Dependant variable is Ln(Actual Price)

Variable	Coefficient	Standard Error	P-Value (two-sided)
Ln(Previous Quarter's price)	0.490	0.037	0.000
Ln(Target Price Index)	0.196	0.028	0.000
Ln(Price of Glass) × Size	0.014	0.001	0.000
Ln(Industrial Production)	-0.008	0.083	0.924
Unemployment Rate	0.016	0.007	0.033
Constant	0.553	0.513	0.281

Fixed Effects by customer, manufacturer, size, and finish

Number of observations	12,605
R-squared	0.94

Data Source(s): Organisation for Economic Co-operation and Development, 03 January 2014, Production and Sales (MEI): Production, OECD.StatExtracts, http://stats.oecd.org/index.aspx?queryid=90#, accessed 03 January 2014.

Organisation for Economic Co-operation and Development, 03 January 2014, Key Short-Term Economic Indicators: Harmonised Unemployment Rate, OECD.StatExtracts, http://stats.oecd.org/index.aspx?queryid=21760, accessed 03 January 2014.

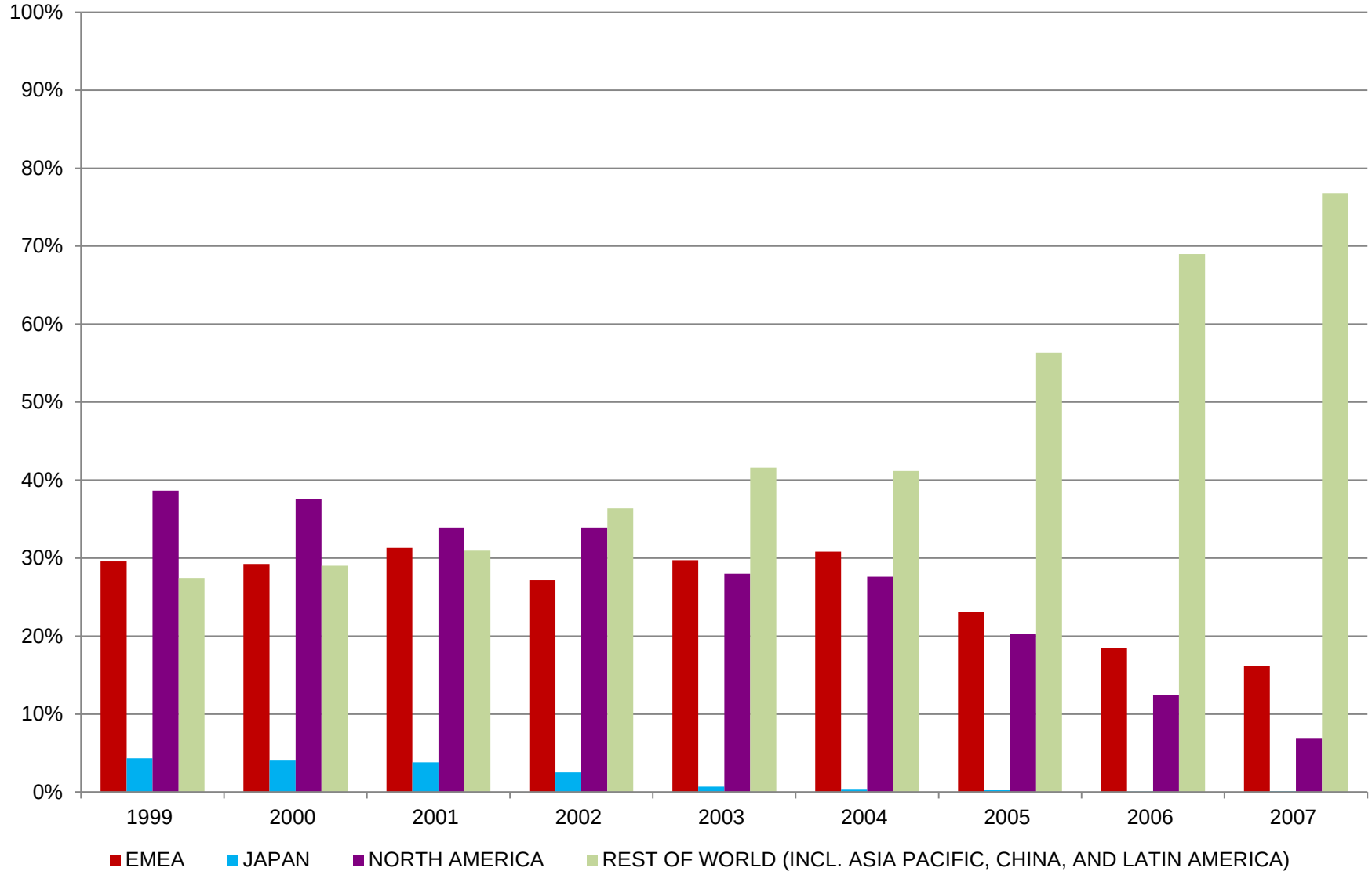
Bank of Korea, Undated, Glass for CRT Use.

Defendant data; see Exhibit 64.

Cartel meeting notes; see Target price-structure.xlsx.

Source File(s): Target price-structure.xlsx; vendor_map.xlsx; vendor_map.do; PriceTracker.do; clean_target.do; clean_defendant.do; target_price_index.do; combine_target_defendant.do; target_price_regressions.do; target_regression_exhibits.do; target_regression_exhibits.xlsx

Regional Shares of Worldwide CRT Monitor Consumption

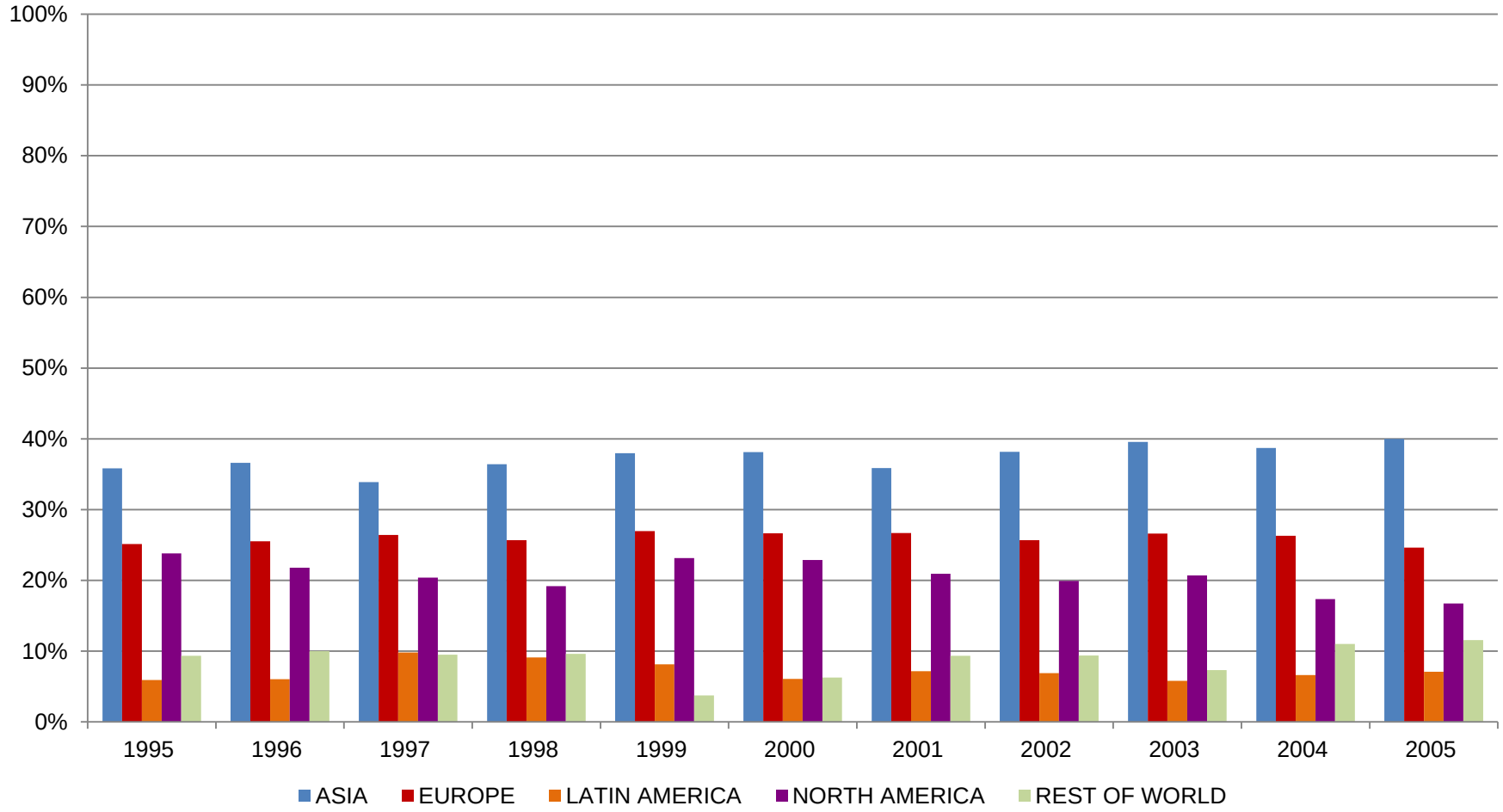


Data Source(s): DisplaySearch, May 2011, Analysis Group, Inc. Custom Data Project, DISP_LCD_000128.

Source File(s): regional production and consumption shares.xlsx

Exhibit 46

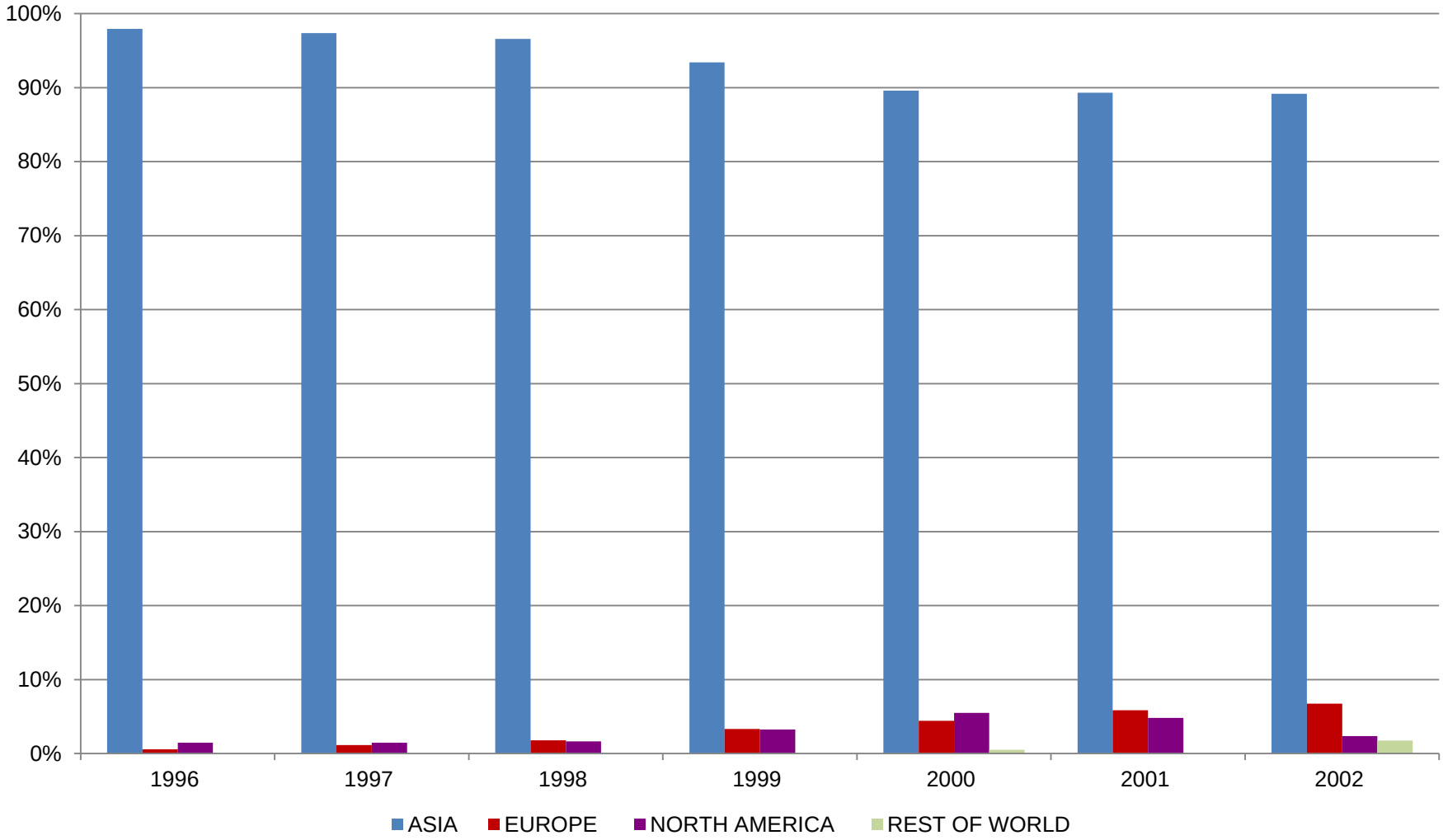
Regional Shares of Worldwide CRT TV Consumption



Data Source(s): Hitachi Displays, June 1999, HDP-CRT00050989.
Hitachi Displays, 21 March 2000, HDP-CRT00022892.
Hitachi Displays, 11 April 2001, HDP-CRT00022920.
Hitachi Displays, April 2003, HDP-CRT00019300.
MT Picture Display, 23 August 2004, MTPD-0576016.
MT Picture Display, November 2005, MTPD-0432713.

Source File(s): regional production and consumption shares.xlsx

Regional Shares of Worldwide CDT Production

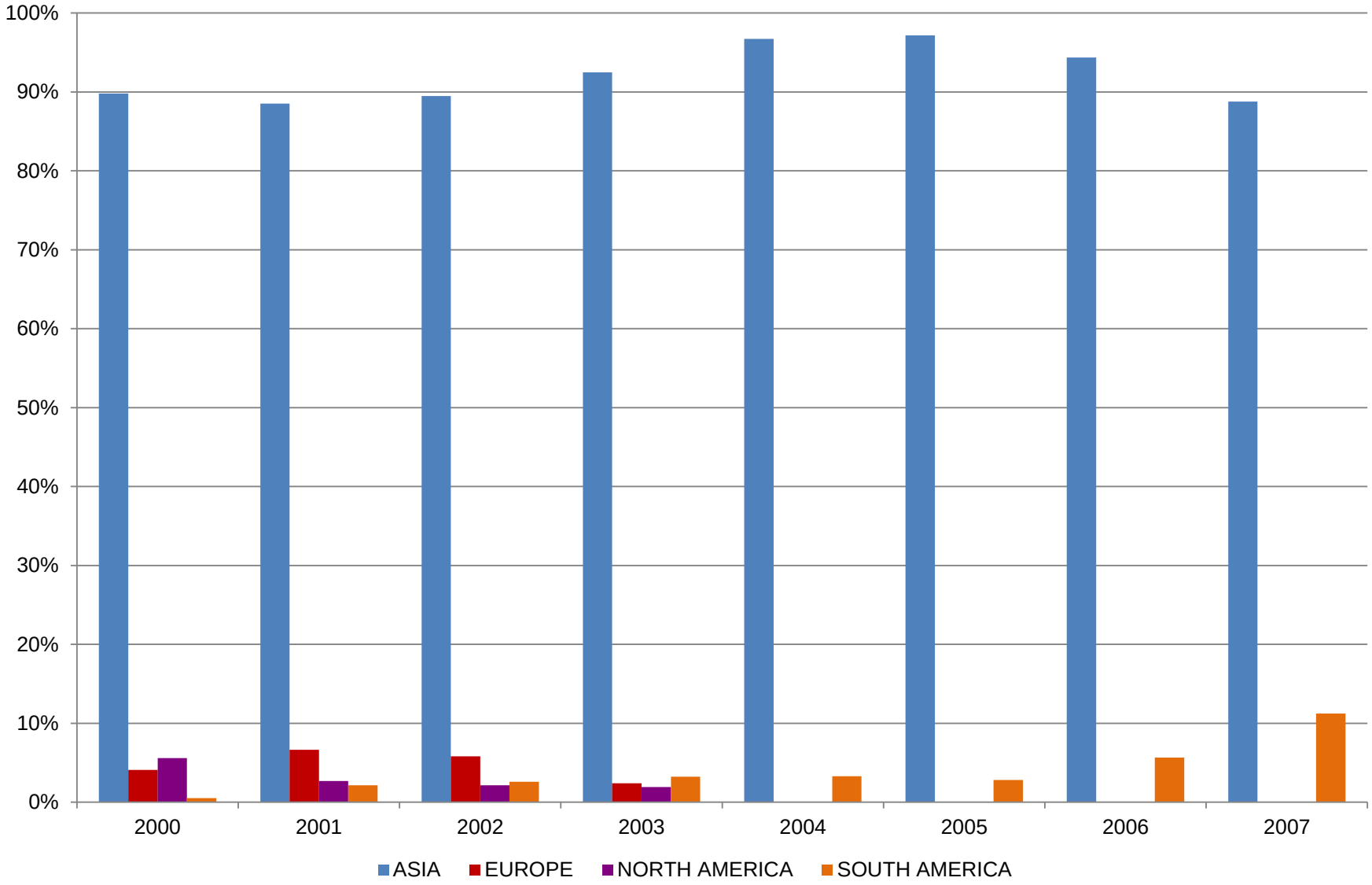


Note(s): South America is included in Rest of World.

Data Source(s): Samsung, 11 December 2003, Worldwide CDT Manufacturer's Status, SDCRT-0201291.
Hitachi Displays, 09 May 2001, HDP-CRT00023725.
MT Picture Display, June 2003, MTPD-0423918.

Source File(s): regional production and consumption shares.xlsx

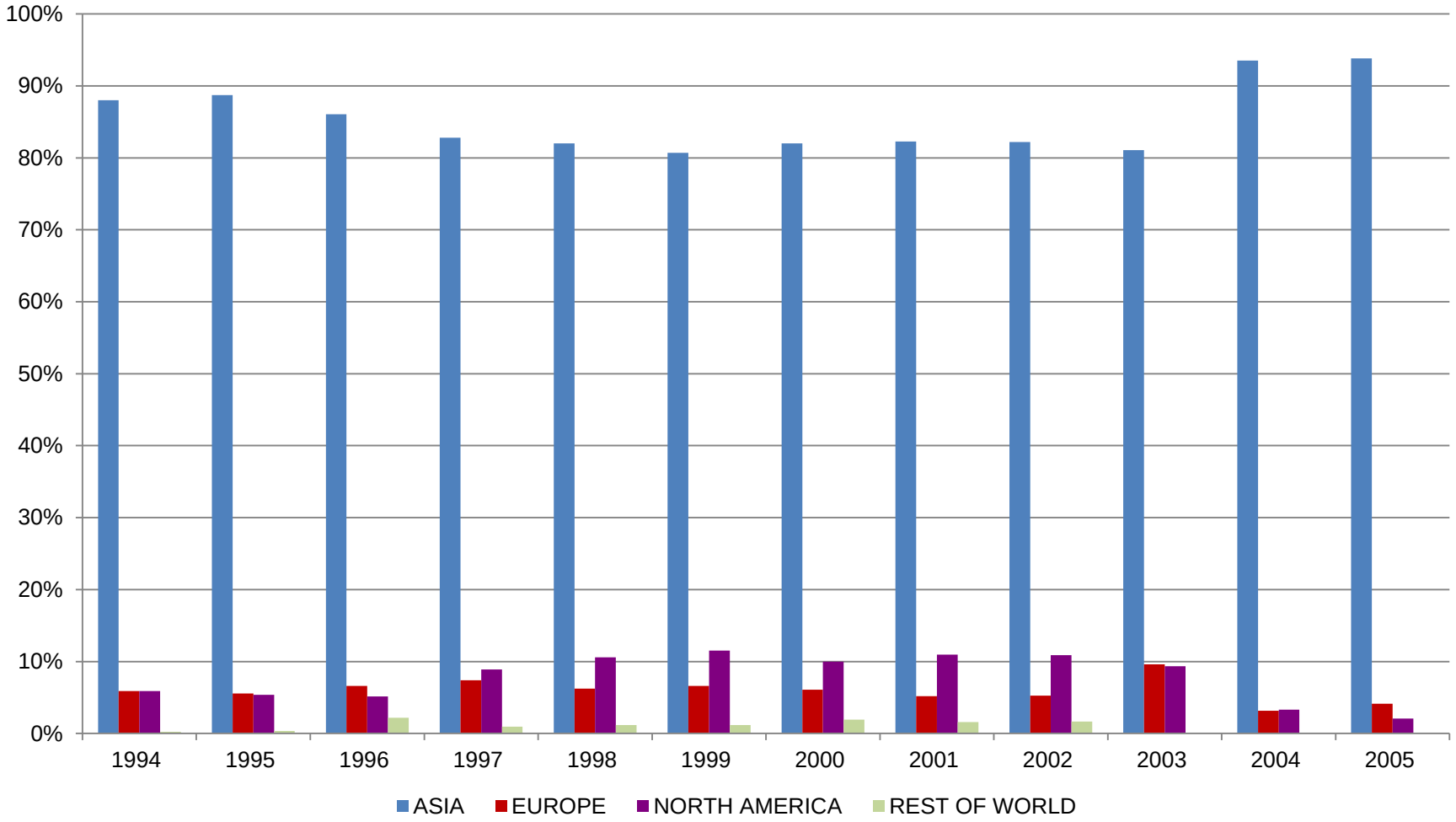
Regional Shares of Worldwide CDT Capacity



Date Source(s): See Exhibit 2.

Source File(s): Capacity Worksheets.xlsx; cdt regional shares.do; early_capacity_load.do; capacity_load.do; capacity_database.do; database edits.do; regional capacity shares.xlsx

Regional Shares of Worldwide CRT Monitor Production



Note(s): South America is included in "Rest of World".

Data Source(s) Hitachi Displays, June 1999, HDP-CRT00050989.

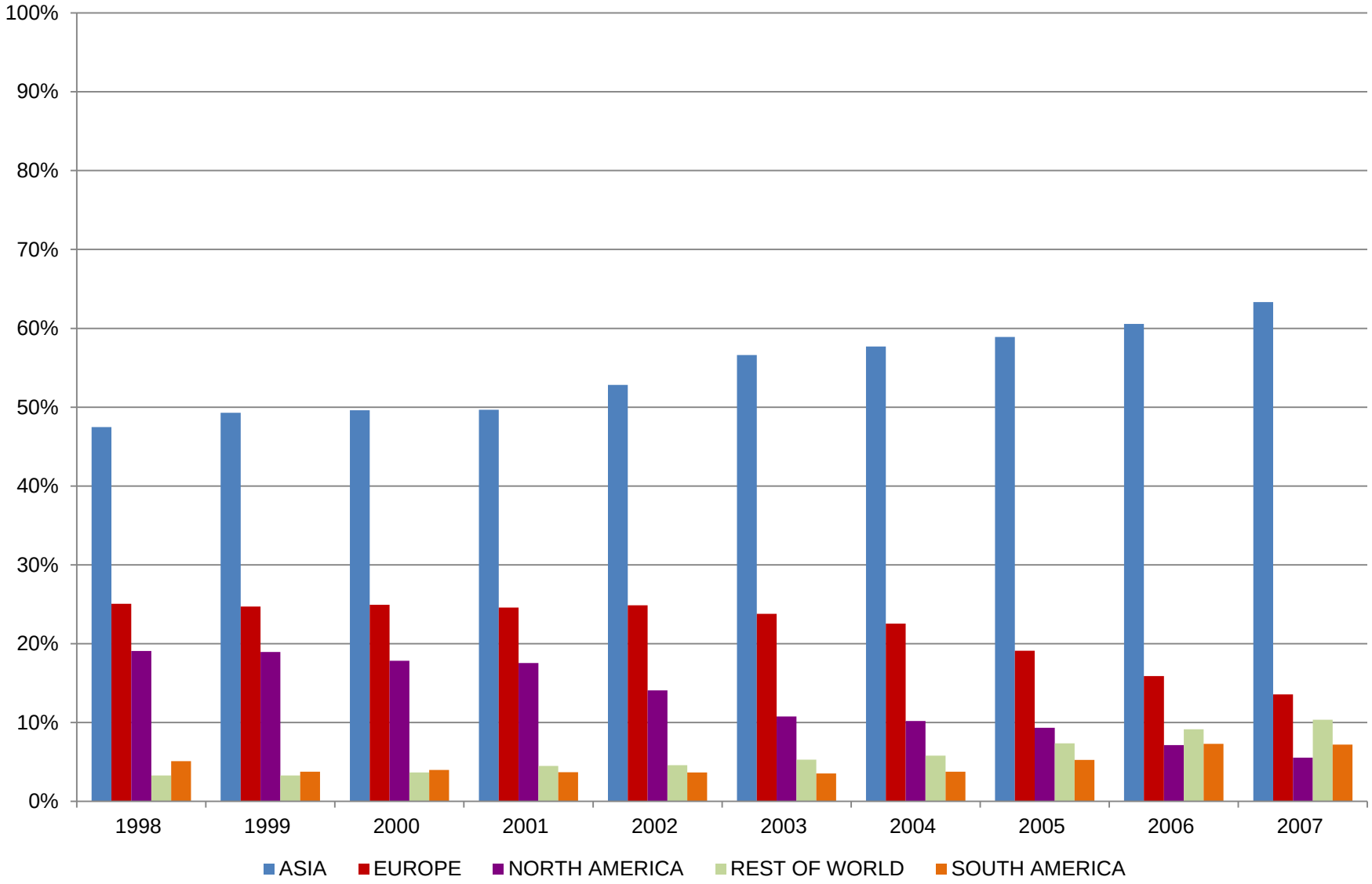
Toshiba Electronics Taiwan, 24 April 2001, CDT & Monitor Demand Supply Analysis, TET-CRT-00003403.

MT Picture Display, June 2003, MTPD-0423918.

iSuppli, 2006, Monitor Revenues Dip on Falling LCD Prices, Seasonal Sluggishness - Worldwide Monitor Market Tracker, LGE00069046.

Source File(s): regional production and consumption shares.xlsx

Regional Shares of Worldwide CPT Production

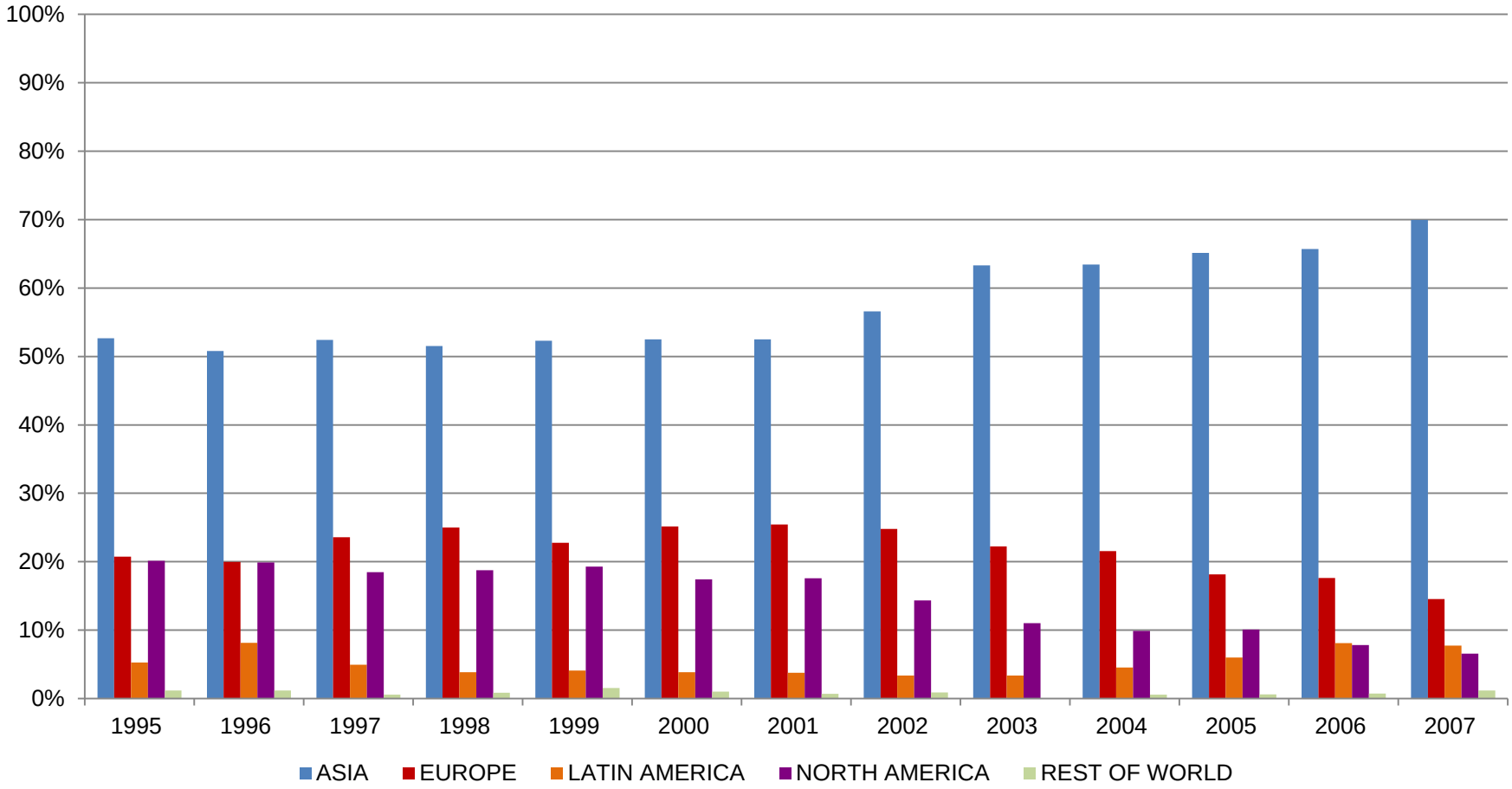


Data Source(s): Samsung SDI, 27 February 2007, SDCRT-0203542.

Source File(s): regional production and consumption shares.xlsx

Exhibit 51

Regional Shares of Worldwide CRT TV Production



Data Source(s): Hitachi Displays, June 1999, HDP-CRT00050989.
Hitachi Displays, 21 March 2000, HDP-CRT00022892.
Hitachi Displays, 11 April 2001, HDP-CRT00022920.
Hitachi Displays, April 2003, HDP-CRT00019300.
MT Picture Display, 23 August 2004, MTPD-0576016.
Samsung SDI, 27 February 2007, SDCRT-0203542.
MT Picture Display, 13 July 2007, MTPD-0473547.

Source File(s): regional production and consumption shares.xlsx

Intense Competition Leads to Low Profit Rates

Trade press and financial analysts

“The PC industry in general, and the notebook industry in particular, is not highly profitable.” Foster, William, Cheng, Zhang, Dedrick, Jason, and Kenneth L. Kraemer, 2006, Technology and Organizational Factors in the Notebook Industry Supply Chain, Personal Computing Industry Center Paper 382, at 14.

"Today, the PC business is showing all the signs of a brutal price war: rapid price cuts, rebates and lots of freebies. Dell Computer Corp., which launched the current price battle at the end of last year, now is tossing in free delivery, a free printer and free Internet access to customers who buy a PC through its Web site. That's a good thing for customers. But computer makers are reeling as the stiffening competition slices into profits". McWilliams, Gary, 26 March 2001, Price War Squeezes PC Makers --- Cuts Make Companies Bleed As Profits, Sales Decline; Some Predict a Shakeout, Wall Street Journal, Eastern Edition, at B.1.

"That markup of nearly 50% of the total cost is a 'healthy profit margin' for Amazon, said Van Baker, a Gartner Inc. analyst, adding that most consumer products have markups of 20% to 25% of total cost. 'A markup of 50% of total cost is almost impossible to do in consumer electronics just because the market is so competitive'." Hamblen, Matt, 22 April 2009, Material costs for Kindle 2 are about half its retail price, ComputerWorld, http://www.computerworld.com/s/article/9131974/Materials_costs_for_Kindle_2_are_about_half_its_retail_price_, accessed 14 September 2012, at 1.

"Indeed, even as consumers inexorably move toward buying ever-larger screens and retailers' revenues climb, competition is forcing price cuts. And as the low-price, high-volume mass merchants like Wal-Mart or Costco become major vendors of big-screen HDTVs, all retailers are forced to keep their prices - and their profit margins - as low as possible". Taub, Eric A., 25 August 2007, If There's A High-Definition TV in Your Future, Wait Till After the Holidays, The New York Times, http://www.nytimes.com/2007/08/25/business/yourmoney/25TELE.html?pagewanted=all, accessed 14 September 2012, at 2.

Industry participants

A slide from Toshiba Asia presentation states: "Market trend ... Forecast fm Y2002 [bullet] All CTV maker [sic] have been getting tired of no-profit discount competition". Toshiba, 05 July 2001, CPT World Wide Technical Engineering Meeting, TET-CRT-00002966 - TET-CRT-00002988, at 2971.

Samsung testified: "The dealers and distributors that we are doing business with today have evolved to be able to support -- sell and support higher-technology TVs and they have refined their operations to a point where they can work on lower margins, very much like we do. It is a very, very competitive business and there is a continuous squeeze on margins due to the competitiveness." 17 July 2012, Deposition of Samsung Electronic America and Samsung Electronic Corporation 30(b)(6) Witness Steve Panosian, at 150:16-25.

"CPT [Chunghwa] President Lin indicated that raising the price on 15" not only benefits 15" CDT makers, but also gives Monitor makers the opportunity to adjust the price to create some profit margin for their no-profit-base business..." Chunghwa Picture Tubes, LTD, 23 June 1999, Business Meeting Report, CHU00030787 - CHU00030794, at 0791.01E.

“As a result of intense price competition in the IT products and services distribution industry, our [Ingram Micro’s] gross margins have historically been narrow and we expect them to continue to be narrow in the future.” Ingram Micro, 26 January 2008, Ingram Micro Form 10-K 2007, http://www.sec.gov/Archives/edgar/data/1018003/000095013708002845/a38343e10vk.htm, accessed 19 May 2008, at 11.

“As a result of significant price competition in the IT [Information Technology] products and services industry, our [SYNNEX’s] gross margins are low, and we expect them to continue to be low in the future.” SYNNEX, 01 February 2008, SYNNEX Corporation Form 10-K 2007, http://www.sec.gov/Archives/edgar/data/1177394/000119312508029448/d10k.htm, accessed 19 May 2008, at 9.

Toshiba testified: "Q. Would you -- is it fair to say that the television business that TACP [Toshiba America Consumer Products] was in was a competitive business? A. Yes. [...] BY MR. LEBSOCK: Q. Okay. And specifically with respect to the CRT television business, was that a competitive business? [...] THE WITNESS: All television is competitive business. It's all very -- the margins are all very low to nonexistent." 01 August 2012, Deposition of Toshiba America Consumer Products and Toshiba America Information Systems 30(b)(6) Witness Richard Eugene Huber, at 76:16 - 77:9.

High Degree of Competition in the Production of CRT Products

Trade press & financial analysts

"Noel Leeming Group merchandise general manager Jason Bell says consumer electronics is 'one of the most competitive retail industries there is.'" Mace, William, 26 July 2010, Television prices plummet at a store near you, http://www.stuff.co.nz/technology/digital-living/3956050/Television-prices-plummet-at-a-store-near-you, accessed 27 July 2010, at 1.

"DELL INC. slashed its personal-computer prices across the board, taking aim at rival Hewlett-Packard Co. and signaling a brutal new phase of competition in an industry that has just begun to pick itself off the floor." McWilliams, Gary and Tam Pui-Wing, 21 August 2003, Dell Price Cuts Put a Squeeze On Rival H-P, Wall Street Journal, Eastern Edition, at B.1.

"Such is the new pricing order in the hypercompetitive world of PCs." Sager, Ira, 16 November 1998, Dream Days For Desktops, BusinessWeek, http://www.businessweek.com/1998/46/b3604022.htm, accessed 11 April 2008, at 1.

From UBS Investment Research: "We believe the pricing trends and sales in this holiday season will be indicative of the level of retail competition and, more importantly, consumer receptiveness to flat TVs going into 2005." UBS Investment Research, 15 December 2004, Flat TV Price Tracker #2, Global Equity Research, CHWA00032115 - CHWA00032128, at 2116.

"Today, competition in TV industry not only becomes more drastic than before but also affects the relationship between different roles in TV value chain." Hongquan, Xu, 2003, Strategy Analysis Report in China TV Market for Philips, Theseus International Management Institute, PHLP-CRT-039598 - PHLP-CRT-039648, at 9600.

CRT product makers, distributors, and retailers

"Home PC sales in the U.S, serving as the warning canary for the industry, fell 24% in February, the third straight month of such declines. What's more, the drop-off also is being seen in small-business and corporate PC purchases. 'I don't see much difference across these categories right now,' says Webb McKinney, the head of Hewlett-Packard Co.'s new Business Customer Organization. 'It's very, very competitive'." McWilliams, Gary, 26 March 2001, Price War Squeezes PC Makers --- Cuts Make Companies Bleed As Profits, Sales Decline; Some Predict a Shakeout, Wall Street Journal, Eastern Edition, at B.1.

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"Indeed, even as consumers inexorably move toward buying ever-larger screens and retailers' revenues climb, competition is forcing price cuts. And as the low-price, high-volume mass merchants like Wal-Mart or Costco become major vendors of big-screen HDTVs, all retailers are forced to keep their prices - and their profit margins - as low as possible." Eric A. Taub, 25 August 2007, If There's A High-Definition TV in Your Future, Wait Till After the Holidays, The New York Times, http://www.nytimes.com/2007/08/25/business/yourmoney/25TELE.html?pagewanted=all, accessed 14 September 2012, at 2.

"The greatest influence in the supply chain still remains with the mass retailers. Their purchasing power and ability to reach millions of consumers exert enormous pressure on manufacturers. Competition among these retail titans has forced lower prices." 3M Precision Optics, Inc., March 2002, Projection Television Past & Future 2003 Global Consumer Market, MTPD-0202647 - MTPD-0202669, at 2658.

"Albin F. Moschner, Zenith's president and chief executive, said the dismal second quarter resulted from brutal price competition as unit sales of color televisions fell 2.3 percent in the first half of the year, instead of rising by about that amount as the industry had projected." Feder, Barnaby J., 18 July 1995, Last U.S. TV Maker Will Sell Control to Koreans, The New York Times, http://www.nytimes.com/1995/07/18/us/last-us-tv-maker-will-sell-control-to-koreans.html?pagewanted=all&src=pm, accessed 10 September 2012, at 2.

Panasonic testified: "Q. How competitive would be characterize was [sic] the market for you to resell your CRT TVs? A. Very. Frankly, it was ridiculously competitive as compared to almost any other industry you could be, I guess, in the world. I mean, it's a crazy business." 18 July 2012, Deposition of Panasonic North America 30(b)(6) Witness Edwin Wolff, at 60:3-7.

CRT manufacturers

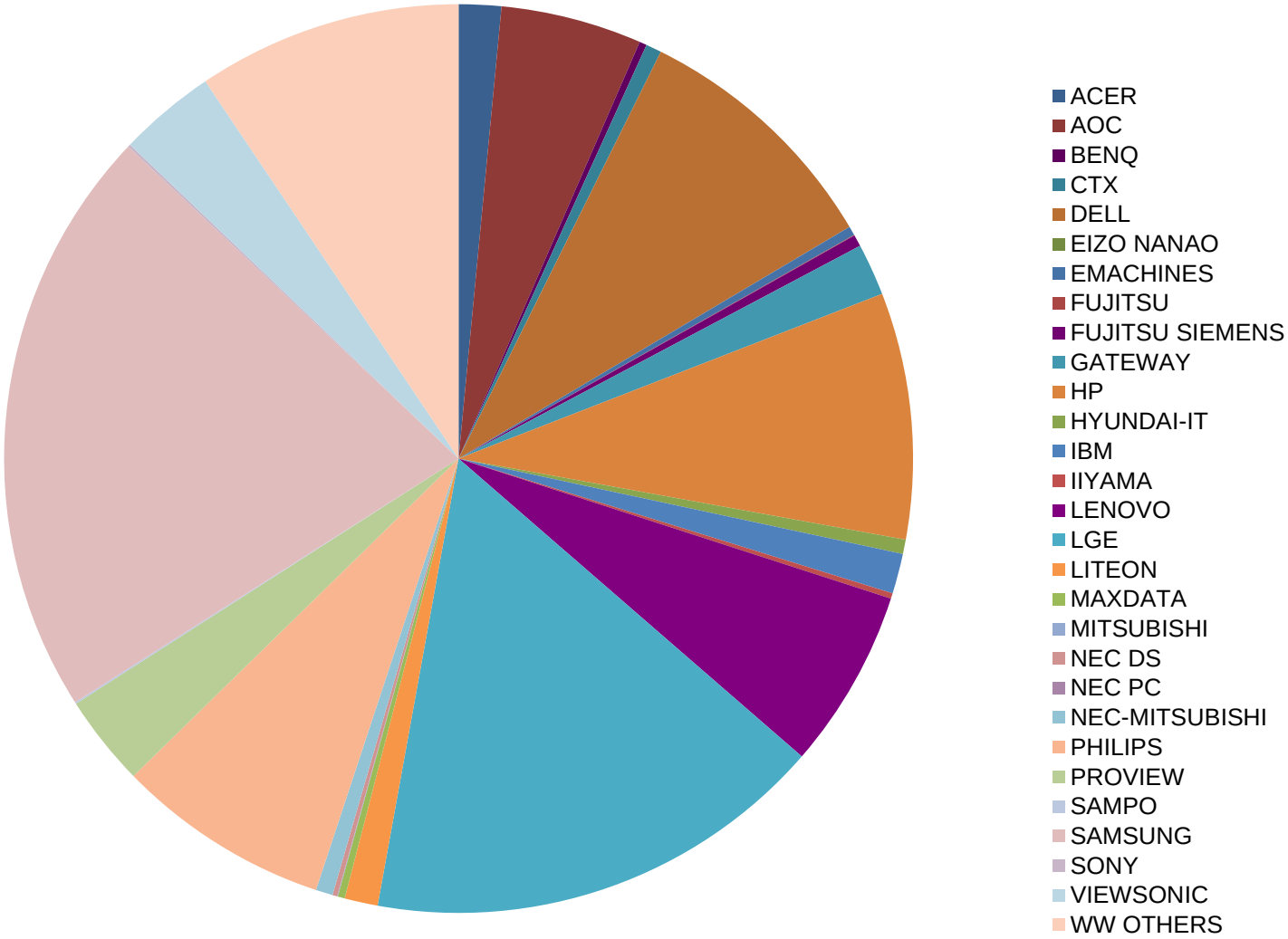
"In the future, how can the three makers show forth their sincerity, eliminate vicious price competition and jointly resist the price slashing of the PC brand makers and monitor OEM makers." Chunghwa Picture Tubes, LTD, 2002, CDT Market Analysis, CHU00660198 - CHU00660199, at 0198E.

From CDT top management meeting notes: "[A]nyway, 17" monitor market price has indeed plunged below the reasonable price level of $160 as a result of competition among monitor makers." Chunghwa Picture Tubes, LTD, 23 June 1999, Business Meeting Report, CHU00030787 - CHU00030794, at 0789.01E.

An internal Samsung e-mail regarding a meeting with retailer Best Buy states: “Competition Among Manufacturers Is Fierce & Competition Among Retailers Is Fierce.” Samsung Electronics America Inc., 23 October 2006, BBY Korea Meeting Recap, SEAI-CRT-00383647 - SEAI-CRT-00383650, at 3648.

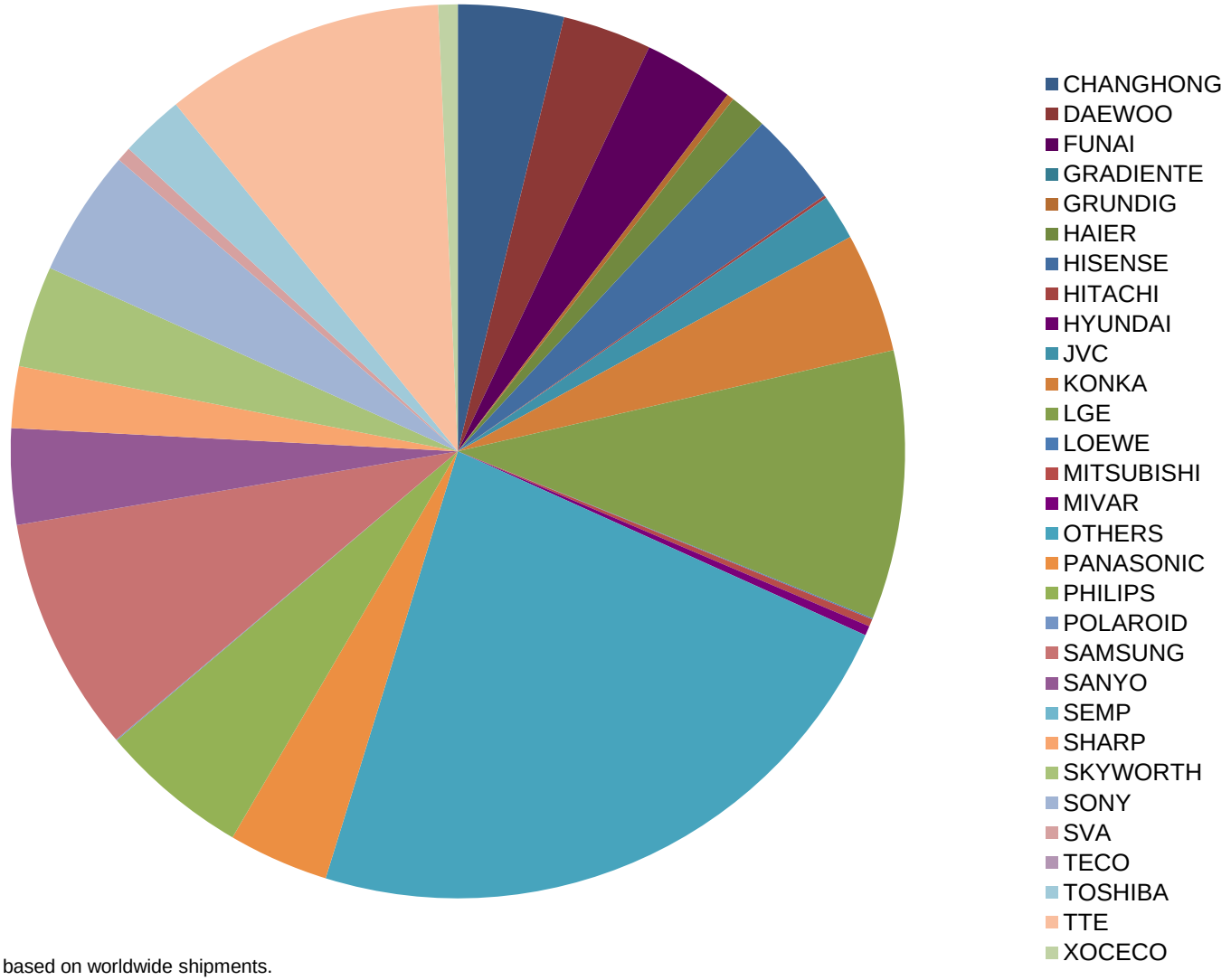
A slide from MTPD presentation states: "State of CRT/TV Industry [bullet] Fierce competition (Global)". Greg Tatusko, Undated, Clarifying Consumer TV Choices, MT Picture Display Corporation of America, MTPD-0161403, at 11.

Monitor Brand Worldwide Market Shares, 2004-2006



Note(s): Market shares based on worldwide shipments.
Data Source(s): DisplaySearch, 2007, Quarterly Desktop Monitor Shipment and Forecast Report, CHU00154421.
Source File(s): TV & Monitor Brand HHI.xlsx

TV Brand Worldwide Market Shares, 2005-2006



Note(s): Market shares based on worldwide shipments.
Data Source(s): DisplaySearch, 2007, DisplaySearch Q2'07 Quarterly Global TV Shipment and Forecast Report, SEAI-CRT-00223186.

Exhibit 56

Defendants Indicate that Pass-Through Occurs

General Purchasing Agreement between Chunghwa Picture Tubes and Philips Consumer Electronics International states: "Supplier agrees to use commercially reasonable efforts to maximize efficiencies and realize cost reductions. Decreases in prices or cost savings will be passed along to Buyer." Chunghwa Picture Tubes, LTD, 01 January 2004, General Purchasing Agreement, CHU00628898 - CHU00628952, at 8903.

"CPT [Chunghwa] President Lin indicated that raising the price on 15" not only benefits 15" CDT makers, but also gives Monitor makers the opportunity to adjust the price to create some profit margin for their no-profit-base business..." Chunghwa Picture Tubes, LTD, 23 June 1999, Business Meeting Report, CHU00030787 - CHU00030794, at 0791.01E.

Notes from a meeting between Samsung, LG, Orion, Philips, and Chunghwa indicate that industry media recognized the connection between an increase in the price of CRT tubes and an increase in the price of CRT monitors: "Conclusion: Mr. David indicated that recently the newspapers and media have repeatedly published information about the expected rise of CDT and Monitor prices. It is quite helpful for our CDT and Monitor makers to raise the prices even further in the future." Chunghwa Picture Tubes, LTD, 26 January 1999, Contact Report, CHU00030701 - CHU00030704, at 0702.01E.

Notes from a meeting between Chunghwa, Samsung, LPD, and Orion state: "CDT price increase topic: CPT [Chunghwa] indicated that the $2 price increase this time was to facilitate monitor makers' transfer of the CDT increase to customers. It will increase each size again by $3 in April. It hopes that makers can have a common understanding and implement accordingly. Though neither SDI/LPD have objected, CPT hopes that it can progress with discussions and obtain a final decision at next month's CEO meeting." Chunghwa Picture Tubes, LTD, 22 February 2002, Visitation Report (Submit), CHU00031183 - CHU00031185, at 1184.02E.

Defendant meeting notes discuss product makers' reactions to a price increase: SDI [Samsung] reported that product maker Delta "can gradually accept increase. Delta is also actively convincing customers to accept increase. SDI will be able to successfully increase 15":$41 [arrow] $43, 17":$54 [arrow] $56, 17"RF: $66." Chunghwa Picture Tubes, LTD, 23 January 2002, Visitation Report, Main Topic: CDT Market Information Exchange and Price/Production Review, CHU00031180 - CHU00031181, at 1180.01E.

Notes from a meeting between SDD [Samsung], LG, Orion, Philips, and Chunghwa state: "Besides, addressing the customers' queries raised by CPT [Chunghwa] as to whether the Korean market would simultaneous [sic] increase the price for 15" [Underlined by hand], SDD [Samsung Display Devices] stated that in addition to SEC [Samsung Electronics Co.] accepting, export customers such as Hyundai/Daewoo have also accepted, but it would require some time for the Monitor makers to reflect the price increase to the PC system makers." Chunghwa Picture Tubes, LTD, 10 August 1999, Visitation Report, Topic: CDT Market Information Exchange and Price Review, CHU00030831 - CHU00030834, at 0831.01E.

Notes from a meeting between Samsung, LG, Orion, Philips, and Chunghwa state: "President Lin also indicated that 15" tube price will be raised and slightly reduce 17" tube price from August with an objective to shorten the price differential between the two and encourage the migration of market demand to 17"; since the price adjustment was just made in August, the impact has yet to be felt. It is estimated that the impact of price increase will start to be felt in the market place beginning in December." Chunghwa Picture Tubes, LTD, 20 September 1999, Visitation Report (Submit), CHU00030855 - CHU00030868, at 0855.02E - 0855.03E.

Chunghwa's notes state under Price Hike: "[W]e should also inform the customers of a possible second stage of price hike, so that they can take time to pass on to OEM customers." Chunghwa Picture Tubes, LTD, 25 March 2004, Return-from-Abroad Trip Report, CHU00031240 - CHU00031247, at 1242E.

From internal Hitachi correspondence: "Tatung/Taiwan is one of 15 inch monitor supplier to Macintosh Product Operations(US market)/Apple Computer Inc. Hitachi recently proposed price increase of 15 inch CDT to Tatung/Taiwan, who has eventually transferred this price requirement to Apple." Effler, F. Skip, 21 September 1994, Apple: 15" Monitor Price Up, HEDUS-CRT00126016 - HEDUS-CRT00126021, at 6017.

Notes from a meeting between Samsung, LG, Orion, Chunghwa, and Philips state: "Mr. Jerry [from Philips] claimed that he had already expressed to PH [Philips] BU before the Lunar New Year that the price of 17" would be increased starting in April. PH BU has also conveyed the price increase information to Dell. Mr. Ha also claimed that its headquarters had conveyed the price increase information to SEC. SEC has also informed its customers that the sales price would be increased again." Chunghwa Picture Tubes, LTD, 19 March 1999, Visitation Report [Submitted], CHU00030731 - CHU00030733, at 0731.02E.

Meeting notes suggest that Samsung Electronics Co. [SEC] was expected to increase monitor prices in response to a CDT price increase: "According to Mr. Kim, the current CDT price which SDD [Samsung Display Devices] supplies to SEC, was totally in reference to the price of its major customers (such as ACER/Lite-on). Additionally, prices to customers increased again on September 1. SEC was no exception. SEC will increase sales prices to its customers (Apple, etc.) starting October 1." Chunghwa Picture Tubes, LTD, 18 September 1995, Customer Contact Report, CHU00028865 - CHU00028867, at 8867E.

Industry Participants Indicate that Pass-Through Occurs

CRT product makers

“Our [Dell’s] general practice is to rapidly pass on cost declines to our customers to enhance customer value.” Dell, 14 March 2008, Dell Form 10-K 2008, http://www.SEC.gov/Archives/edgar/data/826083/000095013408005718/d55156e10vk.htm, accessed 20 May 2008, at 5.

In a Harrah's Operating Company request for proposal for LG Electronics USA, Inc. to supply Harrah's with LCD, HD Plasma, HDTV CRT, and Digital CRT televisions, Harrah's states: "Harrah's realizes that a fixed price model may not be the most equitable over time. Please provide a manner to index the price that would be tied to raw materials used in production. The price should reflect the movement of base materials." Harrah's Operating Company, Inc., 09 February 2006, Harrah's Operating Company Request for Proposal, LGE00058322 - LGE00058349, at 8339.

General Purchasing Agreement between Chunghwa Picture Tubes and Philips Consumer Electronics International states: "Supplier agrees to use commercially reasonable efforts to maximize efficiencies and realize cost reductions. Decreases in prices or cost savings will be passed along to Buyer." Chunghwa Picture Tubes, LTD, 01 January 2004, General Purchasing Agreement, CHU00628898 - CHU00628952, at 8903.

In an agreement between Dell and an unnamed supplier: "Cost Reduction. SUPPLIER shall review with Dell, on an ongoing quarterly basis, a value chain analysis for each Product, and the cost trend for the key components including currency content analysis as well as all passthrough expenses. SUPPLIER agrees that the price of the Products will be reduced in accordance with any cost reductions realized." Dell, Undated, Master Purchase Agreement [unsigned] [redacted], CHU00734954 - CHU00734957, at 4954.

Trade press

From an article regarding CDT tube price increase: "Jean [monitor maker] has indicated that CPT [Chunghwa] has already increase [sic] 3 usd per tube to them in January and as a consequence, Jean is trying to reflect such cost to their customers." David Y Chang, 22 January 2002, News from Commercial times, Taiwan, PHLP-CRT-052781, at 2781.

Market research firms

DisplaySearch report: "To calculate the CRT TV price, we used the previous quarter's tube prices to determine the current quarter's CRT TV street prices due to the lag between tube shipment and TV shipment. Thus, tube price reductions are reflected in street prices one quarter later." DisplaySearch, 12 March 2006, Quarterly TV Cost & Price Forecast Model & Report, SDCRT-0002283 - SDCRT-0002362, at 2290.

A United States International Trade Commission (USITC) report discusses the growing percentage of the CRT as a percentage of total CRT TV cost. "Because of the increasing cost of glass, the cost of tubes has risen during the period 1982-93. At the same time, the proliferation of integrated circuitry has reduced the cost of electronic television componentry other than picture tubes. Consequently, the share of television receiver cost attributable to the CRT has risen, and currently represents more than half the total unit cost of a finished color television." United States International Trade Commission, May 1995, Industry & Trade Summary: Television Picture Tubes and Other Cathode-Ray Tubes, USITC Publication 2877, http://www.usitc.gov/publications/701_731/pub3695.pdf, accessed 17 May 2012, at 5.

Tube Manufacturers Monitor Street Prices of CRT Products

Chunghwa

From CDT meeting notes: "In addition, LG provided the information that SEC is selling 17" flat products at a low price of $165 market price in the US market. This can be converted into FOB price of $120 and CDT at $70." Chunghwa Picture Tubes, LTD, 27 June 2001, Visitation Report, CHU00031142 - CHU00031147, at 1144.01E.

A spreadsheet file produced by Chunghwa contains tables with street prices of various CRT TVs by retailer. Chunghwa Picture Tubes, LTD, 20 September 2005, TV Price Summary, CHU00303245.

Chunghwa produced a WitsView spreadsheet containing street prices of CRT TVs and monitors in October 2004. WitsView, October 2004, Street Price Survey on TV & Monitor, CHU00646093.

Chunghwa Picture Tubes presentation includes a slide containing street prices for 15" and 17" monitors. Chunghwa Picture Tubes, LTD, August 2001, Agenda, CHU00660408 - CHU00660418, at 0417.

Hitachi

Hitachi USA testified: "Q. Okay. What's your understanding of street price? A. Street price is what the TV actually sells for. Q. Okay. And that's what the TV is sold for to the end user ultimately? A. Yes. Q. Okay. And did HED/US monitor retail prices of televisions? A. As best we could." 03 July 2012, Deposition of Hitachi Electronic Devices (USA) 30(b)(6) Witness Thomas Heiser, at 136:2-11.

Hitachi presentation includes a table titled "Calculation 21" monitors 2Q 2001". Table lists costs of CDT, Materials, Labor Cost, Sales Profit; FOB price; calculated street price; and actual street price. Hitachi, Ltd. Displays, November 2000, Hitachi Color Display Tube, HEDUS-CRT00044346 - HEDUS-CRT00044371, at 4371.

From an internal Hitachi USA letter: "Enclosed is my pricing survey from September." Several tables titled "Monitor Street Pricing - September 1994" with prices of CRT monitors at various retailers follow. Moore, Jerry, 26 October 1994, Price Survey and Other Information, HEDUS-CRT00104763 - HEDUS-CRT00104768, at 4763 - 4765.

Hitachi testified: "Q. And did Hitachi Limited monitor either street prices or retail prices for CRT monitors? A. Yes. Q. Okay. And how did it go about gathering that information? A. Well, for example, one method would be that we ask the OEM customer. And the second method would be that we, employees of Hitachi Limited, when we go on business trip to the U.S., we would just go shopping to different retail shops. And we didn't get the street price, actually, it is rather difficult to get the street price. But we would make a record as to what were the retailer's prices were, and then when we went back to Japan, we report on those." 12 July 2012, Deposition of Hitachi Displays, Ltd. 30(b)(6) Witness Yasuhiro Morishma, Volume I, at 75:24-76:13.

A document produced by HEDUS is a collection of printouts which list online store retail prices for various TV sets at Best Buy, Circuit City, Goodguys.com, Twitter Products, Blue Light, Sears, and Wal-Mart. Hitachi Electronic Devices (USA), 04 December 2001, Online store TV search results [print-out], HEDUS-CRT00018407 - HEDUS-CRT00018470, at 8407 - 8470.

A Hitachi document contains a slide entitled 27" Retail Pricing. Okybo, 11 September 1996, Fax, RE: HIMEX, HEDUS-CRT00146312 - HEDUS-CRT00146317, at 6315.

LG Philips

LGE testified: "Q. How did you keep track of -- of retail or street prices? [...] A. There is nothing we do to track those, but as I mentioned earlier, there is a periodic report published periodically by display research which contained the retail prices. Q. Okay. Why were you interested in the retail or street prices? A. That was because we needed to know where our prices came in compared to the competitors' prices." 09 July 2012, Deposition of LG Electronics 30(b)(6) Witness Mok Hyeon Seong, at 111:22-112:11.

LG Philips Displays presentation contains slides with average CRT TV prices by size during December 2002 - July 2004. LG, June 2004, US Retail Channel Report, PHLP-CRT-012360, at 5.

A spreadsheet produced by LP Philips contains tables with TV set retail prices for various sizes in years 2000-2007. LG Philips Displays, Undated, TV Set Retail Prices, LPD_00014197 at 1. LG Philips Displays, Undated, TV Set Retail Prices, LPD_00014197.

An LG Philips Displays spreadsheet contains a summary of internal data files and reports by region. Under AM (America) tab one of the data files is titled "Retail pricing survey report". Under description of contents it states: "CTV Set prices at retailers". Under frequency of update it states: "2 months". LG Philips Displays, Undated, Database and Report Summary, LPD_00013386.

LG Philips Displays presentation entitled "US Retail Channel Report" contains slides with average CRT TV prices by size during December 2002 - April 2003. LG, 23 April 2003, US Retail Channel Report, PHLP-CRT-024925, at 14-16.

Matsushita

A Beijing-Matsushita Color CRT Company document lists standard retail prices and Black Friday special prices by retailer, brand, technology, and model. Beijing-Matsushita Color CRT Company, 2003, Y2003 Black Friday Promotion Models of Display Category, BMCC-CRT000001186, at 1186.

MT Picture Display produced a document which contains street prices of CRT TVs of various sizes in 1998 through 2007. Undated, Price Spreadsheet, MTPD-0086013.

A spreadsheet attached to an e-mail between Shinichi Iwamoto, sales general manager for Matsushita Display Devices of America (MDDA), and Ayumu Kinoshita, sales engineer for Matsushita Television Networks Company (MTNC), contains CRT prices, the tube supplier, TV prices from MTNC (the product maker), TV prices from the product distributor (Panasonic Consumer Electronics, PCEC), and street prices. E-mail: Iwamoto, Shinichi, 30 July 2002, E-mail, Subject: This is really strictly confidential material, MTPD-0223727E. Spreadsheet: MT Picture Display, 29 July 2002, USA Set Prices - Margins - CRT Price Component Ratio Review, MTPD-0223728E.

Samsung

A document produced by Samsung contains a list of retail prices of 134 different types of CRT-TVs at Best Buy, Circuit City, Wal-Mart, and Sears. Samsung, 27 February 2006, US CRT Price Survey (2/27/'06), SDCRT-0023958.

A document produced by Samsung contains tables with TV retail price survey information. CRT-TV prices are stated for Best Buy and Circuit City. Samsung, 17 January 2006, US FTV Retail Price Survey, SDCRT-0022644.

Samsung Sales Strategy presentation includes a slide with 32" CRT and LCD TV prices at Walmart, Best Buy, and Sears. Samsung SDI, 05 January 2012, '2005 Sales Strategy, SDCRT-0012333, at 8.

Samsung testified: "Q. Was one of the subjects that was discussed at various CRT glass meetings was the street price of CRT monitors? A. Well, there were times when discussions of this kind occurred, but as I mentioned earlier, the -- the amount that went through the direct channel was not very large, and most of the products went to PC OEM makers." 06 June 2012, Deposition of Samsung SDI 30(b)(6) Witness Jaein Lee, Volume I, at 154:7-21.

Samsung testified regarding tracking of street prices of finished CRT products: "Q Do you track so-called street prices at all for competitors? A. Yes. Q. And how do you do that? A. Our marketing team. Information is either given to them verbally in weekly reports based upon the GSBN system, so they do track that information." 16 July 2012, Deposition of Samsung Electronics America 30(b)(6) Witness Kim London, at 229:21-230:5.

Toshiba

Several slides from a TAEC CDT presentation track the street prices of CDT and LCD monitors by size. Toshiba America Electronic Components, Inc., 23 July 2001, WW CDT Meeting, TAEC-CRT-00055069 - TAEC-CRT-00055130, at 5077-5082.

A Toshiba presentation includes a "Monitor Pricing Ideas" section with a table showing average street prices by screen size during the period Q1 1998 through Q1 2001. Toshiba America, 26 April 2001, WW CDT Meeting, TAEC-CRT-00010351 - TAEC-CRT-00010410, at 0357.

In an internal Toshiba e-mail, an employee shares information about monitor prices from Compaq's website: "Looked into the latest web site, I found different information of my previous mail regarding spec on MV920 versus MV940. [paragraph] MV920 0.26/96 kHz/conventional $574. MV940 0.26/85kHz/shortlength $499. [paragraph] The above information is available from Compaq Homepage. Therefore, model name maybe vice versa between SEC and Lite-On. FYI, here is all consumer line monitors." A list with specifications and prices follows. Kazuya Iizuka, 27 June 2000, Re: Liteon-CPQ Consumer 19" P/J (MV940 model), TAEC-CRT-00070348 - TAEC-CRT-00070353, at 0348-0349.

Market Research Firms Monitor and Publish Street Price Data

DisplaySearch report from December 2006 states: "To calculate the CRT TV price, we used the previous quarter's tube prices to determine the current quarter's CRT TV street prices due to the lag between tube shipment and TV shipment. Thus, tube price reductions are reflected in street prices one quarter later". DisplaySearch, 19 December 2006, Quarterly Global TV Shipment and Forecast Report, CHU00004334 - CHU00005025, at 4355.

Among the documents produced by Chunghwa is a WitsView spreadsheet report entitled Display Street Price Survey on TV & Monitor. Report contains street prices of CRT TVs and monitors in October 2004. CPT, October 2004, CHU00646093.

A document produced by Hitachi USA, a Display Monitor report published by Meko ltd., includes street prices of various 21" CRT monitors. Meko Ltd, 19 June 2000, Display Monitor Volume 7 No 25, HEDUS-CRT00174034 - HEDUS-CRT00174040, at 4054.

A document produced by Chunghwa, entitled "UBS Investment Research Flat TV Price Tracker #3", includes prices of CRT TVs at various US retailers. UBS Investment Research, 13 January 2005, Flat TV Price Tracker #3, Global Equity Research, CHWA00032001 - CHWA00032020, at 2004.

DisplaySearch TV Flash Reports track weekly advertised retail prices of TVs, including CRT TVs, at major retailers like Best Buy and Circuit City. Among DisplaySearch TV Flash Reports produced by Defendants are the following documents:

CHWA00225304	CHWA00225707
CHWA00225321	CHWA00225735
CHWA00225357	CHWA00225766
CHWA00225376	CHWA00225825
CHWA00225402	CHWA00225848
CHWA00225419	CHWA00225908
CHWA00225447	CHWA00225931
CHWA00225465	CHWA00225970
CHWA00225485	CHWA00225988
CHWA00225513	CHWA00226020
CHWA00225530	CHWA00226040
CHWA00225548	CHWA00226056
CHWA00225581	CHWA00226082
CHWA00225597	CHWA00226132
CHWA00225612	CHWA00226162
CHWA00225635	CHWA00226189
CHWA00225663	CHWA00226208
CHWA00225689	CHWA00226236

Defendants in TFT-LCD Antitrust Litigation Acknowledge Pass-through Occurred

Defendants acknowledged that pass-through occurred

Defendants HannStar and Toshiba claimed that Best Buy passed-through most of the cost increases to end users: “Ultimately, several companies agreed to inflate prices on LCDs in laptops and TVs Best Buy purchased and sold to its customers. In the trial, the retailer seeks to recover $485.9 million on the LCD panels it purchased indirectly, and $289.9 million on the products it purchased directly from LCD makers, Silberfeld said…Although Best Buy insists that it must recover those ‘hidden costs,’ the defendants have argued that the retailer passed much of those costs along to the consumer, U.S. District Court Judge Susan Illston told the jury Tuesday.” Winegarner, Beth, 23 July 2013, Massive LCD Cartel Cost Best Buy $800M, Jury Hears, Law360, at 1.

Defendant HannStar’s attorney, Robert Freitas, argued that “Best Buy passed on roughly 93 percent of the increased costs to their customers.” Winegarner, Beth, 29 August 2013, Best Buy Tells Jury It's Owed $770M For LCD Price-Fixing, Law360, http://www.law360.com/articles/468864/print?section=competition, accessed 30 August 2013.

Defendants' expert, Dean Edward Snyder, testified at trial that pass-through occurred

Dean Snyder calculated the following pass-through rates for products sold at Best Buy: LCD TVs (147%), monitors (97%), notebooks (132%), mobile phones (87%), cameras (108%), camcorders (147%), MP3 players (109%), and portable DVD players (98%). *See* Best Buy’s Motion for an Order Precluding Defendants From Presenting A Sur-Rebuttal Case, Dkt. No. 317, filed Aug. 26, 2013 in Case No. 07-MD-1827 SI, Case No. 10-CV-4572, and Case No. 12-CV-4114, at 39 (attaching Defendants’ expert’s (Dean Edward Snyder) Demonstratives for the Best Buy LCD Trial).

Dean Snyder’s demonstratives provide the following quote taken from an e-mail from Mike Garretson, an employee at Samsung Semiconductor, to Byung Il Oh, a Samsung representative: “HP pays the integrator a fixed amount over [underlined] the cost of the components for the system. Again, if our Panel price is too high, that will cause HP to have to pay more for the system, and therefore have a high end price at retail.” Snyder, Edward, 26 August 2013, Edward Snyder's Demonstratives for the Best Buy LCD Trial, Case No. 07-MD-1827 SI, Case No. 10-CV-4572, and Case No. 12-CV-4114, at 38.

Dean Snyder’s demonstratives provide the following quote from Genichi Watanabe, Hitachi's Executive Products Manager: “Q. BY MR. ALIOTO: LCD panels, when you sell LCD panels at a lower price to the manufacturers, do you expect that they are going to sell their products to the customers at a lower price? ... THE WITNESS: Yes, I did.” Snyder, Edward, 26 August 2013, Edward Snyder's Demonstratives for the Best Buy LCD Trial, Case No. 07-MD-1827 SI, Case No. 10-CV-4572, and Case No. 12-CV-4114, at 38.

Dean Snyder cites the pass-through used by two of Plaintiff’s experts for sales of Dell notebooks at Best Buy: the cross-sectional (between-SKUs) rate is just below 100%, and the fixed effects rate is around 110%. Snyder, Edward, 26 August 2013, Edward Snyder's Demonstratives for the Best Buy LCD Trial, Case No. 07-MD-1827 SI, Case No. 10-CV-4572, and Case No. 12-CV-4114, at 37.

Dean Snyder testified that his estimated pass-through rate at Best Buy to consumers is 93%: "Q Okay. Now, using that average rate, could we illustrate again what happens to one dollar of overcharge that gets to the Best Buy level? A Yes. Of that, 93 cents is passed on by Best Buy to consumers. Best Buy buys and sells. They're a retailer. So, for a dollar of overcharges that gets to Best Buy, 93 cents hits consumers." 20 August 2013, Best Buy LCD Trial Transcript, Volume 18, In re: TFT-LCD (Flat-Panel) Antitrust Litigation (United States District Court Northern District of California), Case No. 12-CV-4114, at 2752:8 - 14.

Dean Snyder testified that retailers, on average, pass-through cost changes: "[…] But I also -- as I testified earlier, in general, firms pass on, at least on average." 20 August 2013, Best Buy LCD Trial Transcript, Volume 18, In re: TFT-LCD (Flat-Panel) Antitrust Litigation (United States District Court Northern District of California), Case No. 12-CV-4114, at 2826:24 - 25.

Dean Snyder testified about variation in pass-through rates based on transactions: "[…] In general, firms try to pass on their costs. And that's why you can expect pass-on to be not zero all the time, but it's an empirical question." 20 August 2013, Best Buy LCD Trial Transcript, Volume 18, In re: TFT-LCD (Flat-Panel) Antitrust Litigation (United States District Court Northern District of California), Case No. 12-CV-4114, at 2832:19 - 21.

Dean Edward Snyder testified that the overall pass-through rate is important and can be calculated

Dean Snyder testified that it is possible to determine the average extent of pass-through: "[...] I still think you can take an average pass-on rate. It's hard to figure out how pass-on behavior would affect millions of consumers, but again, to figure out how, on average, that Best Buy was damaged, and the extent of overcharges reaching them and being passed on to consumers, that's possible." 20 August 2013, Best Buy LCD Trial Transcript, Volume 18, In re: TFT-LCD (Flat-Panel) Antitrust Litigation (United States District Court Northern District of California), Case No. 12-CV-4114, at 2842:1 - 7.

Snyder testified that (regarding the Best Buy LCD trial), the important aspect of his pass-through study is to estimate the "chunk" that gets passed on to consumers, and to do that it is not necessary to measure state-by-state, store-by-store, or anything else: "[...] what you want to do is figure out what chunk of overcharges reaches Best Buy, and then what chunk gets passed on to consumers. You don't need to know state by state, store by store, et cetera. And what I said earlier outside the Best Buy example is the key summary of the overall opinion. If you take $100 of overcharges at the top, at the Panel level, the overall analysis says $14 -- excuse me, $16 resides upstream with the parties who make LCD finished products. Seventy-eight ends up with consumers. And a little less than 6 ends up with Best Buy." 20 August 2013, Best Buy LCD Trial Transcript, Volume 18, In re: TFT-LCD (Flat-Panel) Antitrust Litigation (United States District Court Northern District of California), Case No. 12-CV-4114, at 2863:14 - 25.

Pass-Through Study Summary Results

Third Party Name	Distribution Chain Level	Product	Begin Date	End Date	Number of Tubes in Study	Pass-through Rate	Significance (Rate = 100%)	R-Squared	Standard Error of Pass-through Rate
Amazon	Internet Retailer	Monitors	01/02/02	11/16/11	19,847	104%	= 100%	0.98	0.02
Amazon	Internet Retailer	Televisions	02/08/02	01/07/11	20,591	117%	> 100%	0.97	0.01
Arrow Electronics	Product Distributor	Monitors	11/24/97	06/26/06	70,703	109%	> 100%	0.97	0.00
BenQ	Product Maker	Monitors	11/02/98	09/21/05	5,037,064	112%	> 100%	0.95	0.00
Best Buy	Brick & Mortar Retailer	Monitors	04/08/96	03/22/09	13,939,131	110%	> 100%	0.91	0.00
Best Buy	Brick & Mortar Retailer	Televisions	04/08/96	12/27/09	39,584,133	124%	> 100%	0.96	0.00
Best Buy.com	Internet Retailer	Monitors	08/18/00	12/29/07	110,200	138%	> 100%	0.95	0.00
Best Buy.com	Internet Retailer	Televisions	06/12/00	12/31/07	451,463	144%	> 100%	0.98	0.00
Buy.com	Internet Retailer	Monitors	01/13/02	01/28/10	473	116%	> 100%	0.99	0.03
Buy.com	Internet Retailer	Televisions	09/27/02	09/06/10	575	105%	> 100%	0.99	0.01
CDW	Internet Retailer	Monitors	01/03/06	01/08/08	53,063	100%	= 100%	0.93	0.02
CDW	Internet Retailer	Televisions	11/08/05	03/29/10	5,721	102%	= 100%	0.98	0.03
Costco	Brick & Mortar Retailer	Monitors	12/16/96	03/11/06	562,712	107%	> 100%	0.99	0.00
Costco	Brick & Mortar Retailer	Televisions	09/03/96	12/08/07	3,945,136	106%	> 100%	0.99	0.00
Dell	Internet Retailer	Monitors	01/02/02	12/31/06	2,739,263	118%	> 100%	0.92	0.00
Dell (Purchase Costs)	Internet Retailer	Monitors	01/02/02	12/31/06	2,716,596	122%	> 100%	0.92	0.00
Envision	Product Maker	Monitors	01/03/01	05/27/08	1,377,421	100%	> 100%	0.79	0.00
Fry's	Brick & Mortar Retailer	Monitors	01/01/98	10/21/06	1,205,681	113%	> 100%	0.97	0.00
Funai	Product Maker	Televisions	01/03/05	07/28/09	10,958,577	113%	> 100%	0.97	0.00
Gateway	Internet Retailer	Monitors	01/05/98	12/30/04	N/A*	112%	> 100%	0.98	0.01
Ingram Micro	Product Distributor	Monitors	12/31/01	12/27/10	2,646,928	102%	> 100%	1.00	0.00
Ingram Micro	Product Distributor	Televisions	12/31/01	12/07/10	4,960	103%	> 100%	1.00	0.01
Kmart	Brick & Mortar Retailer	Televisions	11/25/04	11/19/09	1,314,151	115%	> 100%	0.94	0.00
OfficeMax	Brick & Mortar Retailer	Desktops	01/26/03	12/01/08	90,747	109%	> 100%	0.79	0.03
OfficeMax	Brick & Mortar Retailer	Monitors	01/26/03	09/25/07	231,354	101%	> 100%	0.77	0.01
PC Connection	Internet Retailer	Monitors	07/08/99	10/29/08	23,101	109%	> 100%	0.98	0.01
PC Connection	Internet Retailer	Televisions	02/05/99	01/08/07	232	106%	> 100%	1.00	0.02
PC Mall	Internet Retailer	Desktops	06/06/02	03/07/06	5,638	101%	= 100%	0.95	0.01
PC Mall	Internet Retailer	Monitors	02/27/94	06/18/09	159,587	110%	> 100%	0.98	0.00

Third Party Name	Distribution Chain Level	Product	Begin Date	End Date	Number of Tubes in Study	Pass-through Rate	Significance (Rate = 100%)	R-Squared	Standard Error of Pass-through Rate
PC Mall	Internet Retailer	Televisions	09/24/96	11/19/09	2,001	112%	> 100%	0.99	0.02
Philips	Product Maker	Monitors	06/01/00	08/01/07	2,425,995	110%	> 100%	0.95	0.02
Philips	Product Maker	Televisions	02/01/00	05/01/09	20,975,642	106%	> 100%	0.94	0.01
RadioShack	Brick & Mortar Retailer	Monitors	01/01/02	07/04/09	165,233	108%	> 100%	0.84	0.00
RadioShack	Brick & Mortar Retailer	Televisions	01/01/02	02/29/08	1,016,643	105%	> 100%	0.88	0.00
Sam's Club (Retail Prices)	Brick & Mortar Retailer	Televisions	08/13/01	11/19/05	17,939	98%	= 100%	1.00	0.02
Sam's Club (Transaction Prices)	Brick & Mortar Retailer	Televisions	09/08/01	12/17/05	15,871	113%	> 100%	0.98	0.03
Sanyo	Product Maker	Televisions	12/01/94	07/01/07	N/A*	150%	> 100%	0.96	0.01
Sears	Brick & Mortar Retailer	Monitors	01/05/99	12/28/05	769,667	100%	= 100%	0.71	0.01
Sears	Brick & Mortar Retailer	Televisions	01/05/99	01/14/09	13,418,767	128%	> 100%	0.94	0.00
Sharp Electronics	Product Maker	Televisions	10/01/97	11/01/07	11,496,675	104%	= 100%	0.90	0.03
Target (Retail Prices)	Brick & Mortar Retailer	Monitors	05/01/05	10/01/09	805,388	117%	> 100%	0.99	0.04
Target (Transaction Prices)	Brick & Mortar Retailer	Televisions	05/01/05	10/01/09	805,388	121%	> 100%	0.98	0.09
Tatung	Product Maker	Monitors	09/02/98	10/31/06	222,516	100%	= 100%	0.93	0.01
Tech Data	Product Distributor	Monitors	11/03/97	10/29/07	1,217,901	100%	> 100%	0.99	0.00
Toshiba America Consumer Products (TACP)	Product Maker	Televisions	04/12/95	03/31/06	20,313,733	117%	> 100%	0.97	0.00
Toshiba America Electronics Corporation	Tube Distributor	Tubes for Monitors	04/23/94	06/28/00	1,854,536	96%	= 100%	0.99	0.02
Toshiba America Electronics Corporation	Tube Distributor	Tubes for TVs	04/27/94	11/22/02	12,188,332	100%	> 100%	1.00	0.00
Toshiba America Information Systems	Product Maker	Monitors	11/01/96	04/01/05	327,738	112%	= 100%	0.78	0.14
ViewSonic	Product Maker	Monitors	04/16/97	10/31/01	1,109,928	118%	> 100%	0.96	0.00
Wal-Mart/Sanyo	Brick & Mortar Retailer	Televisions	12/01/94	08/03/09	N/A*	116%	> 100%	1.00	0.01
Wal-Mart (Retail Prices)	Brick & Mortar Retailer	Televisions	06/23/01	08/07/10	48,156	110%	> 100%	0.99	0.05
Wal-Mart (Transaction Prices)	Brick & Mortar Retailer	Televisions	06/25/01	08/07/10	47,141	106%	> 100%	0.99	0.02
Zones	Internet Retailer	Desktops	01/03/00	04/01/03	7,175	113%	> 100%	0.97	0.01
Zones	Internet Retailer	Monitors	01/03/00	01/11/08	41,368	104%	> 100%	0.97	0.00
Envision - Ingram Micro - PC Connection	Multi-level	Monitors	01/15/02	11/19/05	**	127%	= 100%		0.09

Third Party Name	Distribution Chain Level	Product	Begin Date	End Date	Number of Tubes in Study	Pass-through Rate	Significance (Rate = 100%)	R-Squared	Standard Error of Pass-through Rate
Philips - Best Buy	Multi-level	Televisions	06/01/00	07/01/06	***	139%	> 100%		0.07
Philips - Costco	Multi-level	Televisions	06/01/00	02/01/07	****	133%	> 100%		0.07
Panasonic - Best Buy.com	Top-and-bottom	Televisions	06/12/00	04/06/07	15,551	115%	> 100%	0.73	0.06
Samsung - Best Buy	Top-and-bottom	Televisions	01/01/98	12/01/07	2,402,442	155%	> 100%	0.86	0.01
Sanyo - Wal-Mart	Top-and-bottom	Televisions	12/01/94	07/01/07	N/A*	185%	> 100%	0.95	0.19
Sanyo - Wal-Mart	Top-to-bottom	Televisions	12/01/94	07/01/07	N/A*	176%	> 100%		0.16
Toshiba	Top-to-bottom	Televisions	09/03/96	03/31/06	*****	183%	> 100%		0.00

Note(s):

Unless otherwise noted, the number of observations is weighted by the transaction quantity. Studies that are not weighted by transaction quantity are Gateway, Wal-Mart/Sanyo, and the Sanyo - Wal-Mart top-and-bottom and top-to-bottom studies.

Cost data is generally produced in two forms: synchronized with the sales data, or separate from the sales data. Synchronized cost data appears in the sales data as a separate field and does not need to be matched with sales data.

When costs and prices (i.e. purchases and sales) are not synchronized, I calculate average costs for each product over a certain time (generally daily or weekly average costs).

Where possible, I also conduct pass-through studies on desktop computers that are all-in-one computers featuring a built-in CRT monitor, or that are bundled with CRT monitors.

Studies combining Wal-Mart and Sanyo data use price lists of Sanyo products sold in Wal-Mart stores. The price variable is Wal-Mart's retail price, and the cost variable is FOB costs from products sold by Sanyo Manufacturing Corporation to Wal-Mart.

The columns Begin Date and End Date represent the oldest and most recent dates for all observations in each study.

All pass-through studies except Toshiba America Electronics Corporation and PC Connection (television) are run with robust standard errors, i.e. I conducted a Breusch-Pagan test for heteroskedasticity and this rejected the null hypothesis of no heteroskedasticity. The Toshiba America Electronics Corproration studies use standard errors that allow for clustering (correlation between observations within each cluster).

* The data used for these studies do not feature sufficient quantity information for a tube count.

** The Envision - Ingram Micro - PC Connection study involves 12,641 tubes at the Envision level, 324 tubes at the Ingram Micro level, and 307 tubes at the PC Connection level.

*** The Philips - Best Buy study involves 1,655,162 tubes at at the Philips level and 1,587,196 tubes at the Best Buy level.

**** The Philips - Costco study involves 890,557 tubes at the Philips level and 822,079 tubes at the Costco level.

***** The Toshiba top-to-bottom study involves 6,035,699 tubes at theTAEC level, 280,337 tubes at the TACP level, and 1,291,761 tubes at the Costco level.

Source File(s):

See Exhibit 71.

Pass-Through Study Explanatory Variable List

Third Party Name	Distribution Chain Level	Product	Price Description	Cost Description	Cost	Size	Brand	Resolution	Flat Screen	HDTV	VCR Combo	DVD Combo	Time	Other Explanatory Variables
Amazon	Internet Retailer	Monitors	Transaction Prices	Synchronized	X	X	X	X						
Amazon	Internet Retailer	Televisions	Transaction Prices	Synchronized	X	X	X			X		X		
Arrow Electronics	Product Distributor	Monitors	Transaction Prices	Synchronized	X	X		X						
BenQ	Product Maker	Monitors	Transaction Prices	Synchronized	X	X		X						
Best Buy	Brick & Mortar Retailer	Monitors	Transaction Prices	Synchronized	X	X			X					Wide screen.
Best Buy	Brick & Mortar Retailer	Televisions	Transaction Prices	Synchronized	X	X			X	X	X	X		Wide screen; HD-ready; Picture-in-picture.
Best Buy.com	Internet Retailer	Monitors	Transaction Prices	Synchronized	X	X	X		X					
Best Buy.com	Internet Retailer	Televisions	Transaction Prices	Synchronized	X	X	X		X	X	X	X		Wide screen; HD-ready; Picture-in-picture; Slim tube.
Buy.com	Internet Retailer	Monitors	Transaction Prices	Synchronized	X	X	X	X	X					
Buy.com	Internet Retailer	Televisions	Transaction Prices	Synchronized	X	X	X		X	X	X	X		
CDW	Internet Retailer	Monitors	Transaction Prices	Monthly Average	X	X		X	X					
CDW	Internet Retailer	Televisions	Transaction Prices	Monthly Average	X	X	X		X	X	X	X		
Costco	Brick & Mortar Retailer	Monitors	Transaction Prices	Weekly Average	X	X	X		X					
Costco	Brick & Mortar Retailer	Televisions	Transaction Prices	Weekly Average	X	X	X		X	X	X	X		Wide screen; HD-ready; Picture-in-picture.
Dell	Internet Retailer	Monitors	Transaction Prices	Synchronized	X	X		X						
Dell (Purchase Costs)	Internet Retailer	Monitors	Transaction Prices	Weekly Average	X	X		X						
Envision	Product Maker	Monitors	Transaction Prices	Synchronized	X	X			X					Speakers.
Fry's	Brick & Mortar Retailer	Monitors	Transaction Prices	Synchronized	X	X	X		X					Refurbished.
Funai	Product Maker	Televisions	Transaction Prices	Monthly Average	X	X	X		X		X	X		
Gateway	Internet Retailer	Monitors	List Prices	Daily Average	X	X								
Ingram Micro	Product Distributor	Monitors	Transaction Prices	Synchronized	X	X		X	X					
Ingram Micro	Product Distributor	Televisions	Transaction Prices	Synchronized	X	X			X	X				Wide screen.
Kmart	Brick & Mortar Retailer	Televisions	Transaction Prices	Weekly Average	X	X	X		X	X	X	X		
OfficeMax	Brick & Mortar Retailer	Desktops	Transaction Prices	Synchronized	X									RAM; Hard Drive Size; Processor Type; Processor Speed; Condition Type; Distribution Channel
OfficeMax	Brick & Mortar Retailer	Monitors	Transaction Prices	Synchronized	X	X			X					Condition Type; Distribution Channel.

Third Party Name	Distribution Chain Level	Product	Price Description	Cost Description	Cost	Size	Brand	Resolution	Flat Screen	HDTV	VCR Combo	DVD Combo	Time	Other Explanatory Variables
PC Connection	Internet Retailer	Monitors	Transaction Prices	Weekly Average	X	X	X	X	X					Refurbished.
PC Connection	Internet Retailer	Televisions	Transaction Prices	Weekly Average	X	X	X			X				HD-ready.
PC Mall	Internet Retailer	Desktops	Transaction Prices	Weekly Average	X									RAM; Processor Speed; Retailer (PC Mall, Trend)
PC Mall	Internet Retailer	Monitors	Transaction Prices	Weekly Average	X	X		X	X					Refurbished; Retailer (PC Mall, Trend, SX)
PC Mall	Internet Retailer	Televisions	Transaction Prices	Weekly Average	X	X			X	X	X	X		Retailer (PC Mall, Trend)
Philips	Product Maker	Monitors	Monthly Average Prices	Monthly Average	X	X			X					
Philips	Product Maker	Televisions	Monthly Average Prices	Monthly Average	X	X			X	X	X	X		
RadioShack	Brick & Mortar Retailer	Monitors	Transaction Prices	Synchronized	X	X	X		X					
RadioShack	Brick & Mortar Retailer	Televisions	Transaction Prices	Synchronized	X	X	X		X		X	X		
Sam's Club (Retail Prices)	Brick & Mortar Retailer	Televisions	Weekly Average Prices	Weekly Average	X	X	X				X			
Sam's Club (Transaction Prices)	Brick & Mortar Retailer	Televisions	Transaction Prices	Weekly Average	X	X	X				X		Month	
Sanyo	Product Maker	Televisions	List Prices	Monthly Average	X	X			X	X				Picture-in-picture.
Sears	Brick & Mortar Retailer	Monitors	Transaction Prices	Synchronized	X	X	X							
Sears	Brick & Mortar Retailer	Televisions	Transaction Prices	Synchronized	X	X	X				X	X		
Sharp Electronics	Product Maker	Televisions	Monthly Average Prices	Monthly Average	X	X			X		X	X		
Target (Retail Prices)	Brick & Mortar Retailer	Televisions	Monthly Average List Prices	Monthly Average	X	X			X		X	X		
Target (Transaction Prices)	Brick & Mortar Retailer	Televisions	Monthly Average Prices	Monthly Average	X	X			X		X	X		
Tatung	Product Maker	Monitors	Transaction Prices	Monthly Average	X	X		X					Year	Color Display
Tech Data	Product Distributor	Monitors	Transaction Prices	Monthly Average	X	X		X	X					Speakers; Unbranded (generic).
Toshiba America Consumer Products (TACP)	Product Maker	Televisions	Transaction Prices	Synchronized	X	X				X	X			
Toshiba America Electronics Corporation	Tube Distributor	Tubes for Monito	Transaction Prices	Monthly Average	X									Model Number
Toshiba America Electronics Corporation	Tube Distributor	Tubes for TVs	Transaction Prices	Monthly Average	X									Model Number

Third Party Name	Distribution Chain Level	Product	Price Description	Cost Description	Cost	Size	Brand	Resolution	Flat Screen	HDTV	VCR Combo	DVD Combo	Time	Other Explanatory Variables
Toshiba America Information Systems	Product Maker	Monitors	Monthly Average Prices	Monthly Average	X	X								Remanufactured; Obsolete; Discounted; Limited; Product Line; Multimedia; Casing Color
ViewSonic	Product Maker	Monitors	Transaction Prices	Weekly Average	X	X			X					Multimedia.
Wal-Mart (Retail Prices)	Brick & Mortar Retailer	Televisions	Weekly Average Prices	Weekly Average	X	X	X			X	X			
Wal-Mart (Transaction Prices)	Brick & Mortar Retailer	Televisions	Transaction Prices	Weekly Average	X	X	X			X	X		Month	
Wal-Mart/Sanyo	Brick & Mortar Retailer	Televisions	List Prices	FOB Costs	X	X			X	X				Wide screen, Picture-in-picture.
Zones	Internet Retailer	Desktops	Transaction Prices	Synchronized	X									RAM; Processor Speed
Zones	Internet Retailer	Monitors	Transaction Prices	Synchronized	X	X	X	X	X					
Envision - Ingram Micro - PC Connection	Multi-level	Monitors	Weekly Average Prices	Weekly Average	X	X								
Philips - Best Buy	Multi-level	Televisions	Monthly Average Prices	Monthly Average	X	X			X					
Philips - Costco	Multi-level	Televisions	Monthly Average Prices	Monthly Average	X	X			X					
Panasonic - Best Buy.com	Top-and-bottom	Televisions	Transaction Prices	Monthly Average	X	X			X		X	X		Picture-in-picture.
Samsung - Best Buy	Top-and-bottom	Televisions	Transaction Prices	Monthly Average	X	X			X	X	X			
Sanyo - Wal-Mart	Top-and-bottom	Televisions	List Prices	Monthly Average	X	X			X	X				Picture-in-picture.
Sanyo - Wal-Mart	Top-to-bottom	Televisions	List Prices	Monthly Average	X	X			X	X				Picture-in-picture.
Toshiba	Top-to-bottom	Televisions	Transaction Prices	Monthly Average	X	X			X		X			Wide screen; Picture-in-picture.

Note(s):

Cost data is generally produced in two forms: synchronized with the sales data, or separate from the sales data.

When costs and prices (i.e. purchases and sales) are not synchronized, I calculate average costs for each product over a certain time (generally weekly or monthly average costs).

Where possible, I also conduct pass-through studies on desktop computers that are all-in-one computers featuring a built-in CRT monitor, or that are bundled with CRT monitors.

The Wal-Mart - Sanyo studies use price lists of Sanyo products sold in Wal-Mart stores. The price variable is Wal-Mart's retail price, and the cost variable is FOB costs from products sold by Sanyo Manufacturing Corporation to Wal-Mart.

Source File(s):

See Exhibit 71.

CRT Tube Sales Data

Source Files	Data Cleaning Program	Resulting Data File	Start Date	End Date	Granularity	Application	Size	Shape	Finish
Chunghwa									
CHWA00000001 [Headings for CPTM Transactional Records].xls	CHWA00000002.do	CHWA00000002.dta	1/3/1994	12/29/2006	Transactional	Yes	Yes	No	Yes
CHWA00000005 [CPTF Transactional Records].xls	CHWA00000005.do	CHWA00000005.dta	11/3/1997	12/29/2006	Transactional	Yes	Yes	No	Yes
CHWA00000009 [CPTT Transactional Records 1994-1998].xls	CHWA00000009.do	CHWA00000009.dta	1/4/1994	12/30/1998	Transactional	Yes	Yes	No	Yes
CHWA00000011 [CPTT Transactional Records 1999-2003].xls	CHWA00000011.do	CHWA00000011.dta	1/4/1999	2/27/2003	Transactional	Yes	Yes	No	Yes
CHWA00256935.XLS	CHWA00256935.do	CHWA00256935.dta	12/8/2006	12/29/2007	Transactional	Yes	Yes	No	Yes
CHWA00256936.XLS	CHWA00256936.do	CHWA00256936.dta	1/2/2007	11/17/2011	Transactional	Yes	Yes	No	Yes
CHWA00256937.XLS	CHWA00256937.do	CHWA00256937.dta	-	-	Transactional	Yes	Yes	No	Yes
	CHWA_combined.do	CHWA_combined.dta	1/3/1994	11/17/2011	Transactional	Yes	Yes	No	Yes
CPTM Order Numbers.xlsx									
CHWA00000002 [CPTM Transactional Records].xls									
CHWA00000008 [Headings for CPTT Transactional Records 1994-1998].xls									
CHWA00000010 [Headings for CPTT Transactional Records 1999-2003].xls									
Chunghwa_Addresses.xlsx									
exchange_rates_daily.dta									
exchange_rates_monthly.dta									
Hitachi									
HEDUS-CRT00179555.xlsx	HEDUS-CRT.do	HEDUS-CRT.dta	7/18/1994	6/26/2003	Transactional	Yes	Yes	No	Yes
HDP-CRT00018516-T.xls	HDP-CRT00018516.do	HDP-CRT00018516_1995-1997.dta	1995h1	1997m1	Semiannual	Yes	No	No	No
		HDP-CRT00018516_1997-2004.dta	5/12/1997	2/21/2005	Transactional	Yes	Yes	No	Yes
exchange_rates_daily.dta									
exchange_rates_semiannual.dta									
03 July 2012, Deposition of Hitachi Electronic Devices (USA) 30(b)(6) Witness Thomas Heiser.									
Hitachi, Undated, Specifications, HDP-CRT00018517 - HDP-CRT00018518.									

Source Files	Data Cleaning Program	Resulting Data File	Start Date	End Date	Granularity	Application	Size	Shape	Finish
LPD									
LGE00057595.xls	LG_rofo_load.do	LG_rofo_load.dta							
LPD_00034712.xls	LG_rofo_data_clean.do	LG_rofo_data_clean.dta	Jan-2001	Dec-2003	Monthly	Yes	Yes	No	Yes
LPD_00010955.xls		LG_rofo_data_clean_drop_ottawa.dta							
LGE00057776.xls	lge_clean.do	lge_clean.dta	Jan-1992	Dec-1999	Monthly	Yes	Yes	No	Yes
LGE00057608.xls									
LGE00057028.xls									
LGE00057277.xls									
LGE00057554.xls									
LGE00057335.xls									
LGE00057547_ae.xls									
LGE00057582_ae.xls									
LGE--Highly Confidential 7.xls	lge_purchases_clean.do	lge_purchases_dropoverlap.dta	Jan-2002	May-2008	Monthly	Yes	Yes	Yes	Yes
61 Billing files	lpd_load.do	lpd_load.dta							
LPD_00005516.xls	lpd_clean.do	lpd_clean.dta	Apr-1999	Jun-2004	Monthly	Yes	Yes	No	Yes
LPD_00044227.xls									
Panasonic									
MTPD-0122906.xls	MTPD-0122906.do	MTPD-0122906.dta	Jan-1994	Sep-2007	Monthly	Yes	Yes	Yes	Yes
m_t_mtpd.xlsx									
exchange_rates_daily.dta									
Philips									
YTDDEC93.xlsx	Philips sales clean.do	Philips sales clean.dta	1/3/1993	4/1/1999	Transactional	Yes	Yes	No	Yes
YTDDEC94.xlsx									
YTDDEC95.xlsx									
YTDDEC96.xlsx									
YTDDEC97.xlsx									
YTDDEC98.xlsx									
YTDINVC.xlsx									
Samsung									
SDCRT-0083119.2.xlsx	SDCRT-0083119.2.do	SDCRT-0083119.2.dta	Jan-1998	Dec-2007	Monthly	Yes	Yes	Yes	Yes
aE_SDCRT-0083119.2_with_translations.xlsx									
Translations_of_customer_names.xlsx									
exchange_rates_monthly.dta									

Source Files	Data Cleaning Program	Resulting Data File	Start Date	End Date	Granularity	Application	Size	Shape	Finish
SDI, Undated, Model of SDI CRT Product, SDCRT-0021278 - SDCRT-0021294.									
SDCRT-0021278.xlsx									
Toshiba									
TSB-CRT-00061306-317	TSB-CRT.do	TSB-CRT.dta	10/2/1995	1/14/2004	Transactional	Yes	Yes	No	Yes
TSB-CRT-00061306_AE_translation-TSB-CRT-00061317_AE_translation									
TAEC-CRT-00016371_CONFIDENTIAL.xls	TAEC-CRT-00016371.do	TAEC-CRT-00016371.dta	4/19/1994	6/30/2000	Transactional	Yes	Yes	No	Yes
TAEC-CRT-00016373_CONFIDENTIAL.xls	TAEC-CRT-00016373.do	TAEC-CRT-00016373.dta	7/24/2000	12/2/2003	Transactional	Yes	Yes	Yes	Yes
exchange_rates_daily.dta									
All Defendants									
CHWA_combined.dta	all_defendants_price.do	all_defendants_dropexout_collapsed.dta							
HEDUS-CRT.dta									
HDP-CRT00018516_1997-2004.dta									
lge_clean.dta									
lpd_clean.dta									
lge_purchases_dropoverlap.dta									
LG_rofo_data_clean_drop_ottawa.dta									
MTPD-0122906.dta									
Philips sales clean.dta									
SDCRT-0083119.2.dta									
TAEC-CRT-00016371.dta									
TAEC-CRT-00016373.dta									
TSB-CRT.dta									

Note(s):

Defendants use the worldwide type designation code system (WTDS) for model numbers, with the exception of SDI. Chunghwa's data that includes WTDS codes contains inconsistencies. Therefore, Chunghwa's item number is used instead of WTDS code. Defendants have identified how to determine application, aspect ratio, size, and ITC vs. bare from the WTDS code. The defendants have not produced documentation or identified a method for pulling additional information from the family code or version component of the WTDS number.

Direct Overcharge Models and Sensitivity Checks

CDTs

Model		Overcharge	Standard Error	Root Mean Squared Error	Adjusted R2	Number of Observations
Direct overcharge model		-	-	0.095	0.952	1114
	1995Q2 - 2006Q4	25.0%	4.3%	-	-	-
	2007Q1 - 2007Q4	12.3%	5.6%	-	-	-
…using data from after 2008		.	.	0.096	0.951	1134
	1995Q2 - 2006Q4	24.1%	4.5%	-	-	-
	2007Q1 - 2007Q4	11.8%	5.6%	-	-	-
…without squared demand terms		.	.	0.097	0.951	1114
	1995Q2 - 2006Q4	27.9%	4.9%	-	-	-
	2007Q1 - 2007Q4	19.0%	5.1%	-	-	-
…with lagged cost and demand terms		-	-	0.096	0.952	1112
	1995Q2 - 2006Q4	23.3%	4.0%	-	-	-
	2007Q1 - 2007Q4	8.3%	4.7%	-	-	-
...with a single cartel period (1995Q2 - 2006Q4)		18.5%	4.5%	0.096	0.951	1114
...with the complaint cartel period (1995Q2 - 2007Q4)		19.4%	5.8%	0.096	0.951	1114

CPTs

Model		Overcharge	Standard Error	Root Mean Squared Error	Adjusted R2	Number of Observations
Direct overcharge model		-	-	0.081	0.986	2574
	1995Q2 - 2006Q4	9.5%	2.0%	-	-	-
	2007Q1 - 2007Q4	3.2%	1.7%	-	-	-
…without squared demand terms		-	-	0.081	0.986	2574
	1995Q2 - 2006Q4	9.3%	2.1%	-	-	-
	2007Q1 - 2007Q4	4.9%	1.6%	-	-	-
…with lagged cost and demand terms		-	-	0.083	0.985	2566
	1995Q2 - 2006Q4	9.9%	2.5%	-	-	-
	2007Q1 - 2007Q4	3.5%	2.1%	-	-	-
...with a single cartel period (1995Q2 - 2006Q4)		7.1%	1.3%	0.081	0.986	2574
...with the complaint cartel period (1995Q2 - 2007Q4)		4.8%	1.7%	0.081	0.986	2574

Data Source(s): See Exhibit 83.

Source File(s): CDT_model.do; CPT_model.do; robustness.do; sensitivity_table.do; lcd_data.do; input_data.do; oecd_data.do; bok_glass_ppi.do

Top-to-Bottom Pass-Through Method



A tube manufacturer increases its prices by $1

In response to the tube price increase of $1, a tube distributor increases its prices by $1.15; the pass-through rate at this level is **115%**.

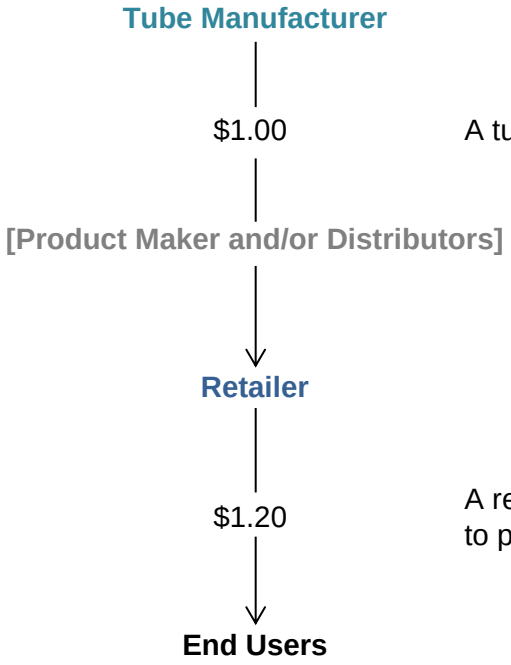
In response to the $1.15 tube price increase, a product maker increases its TV/monitor prices by $1.25; the pass-through rate at this level is **109%**.

In response to the $1.25 TV/monitor price increase, the finished product distributor increases the price of TVs/monitors by $1.25; the pass-through rate at this level is **100%**.

In response to the $1.25 TV/monitor price increase from the finished product distributor, the retailer increases its price by $1.30; the pass-through rate at this level is **104%**.

End users paid an additional $1.30 as a result of the $1.00 tube price increase. The cumulative pass-through rate can be calculated by multiplying the pass-through rates at each level: 115% * 109% * 100% * 104% = **130%.** Note that the cumulative pass-through rate (130%) multiplied by the original price increase ($1.00) yields the price increase faced by end consumers: $1.30.

Top-and-Bottom Pass-Through Method



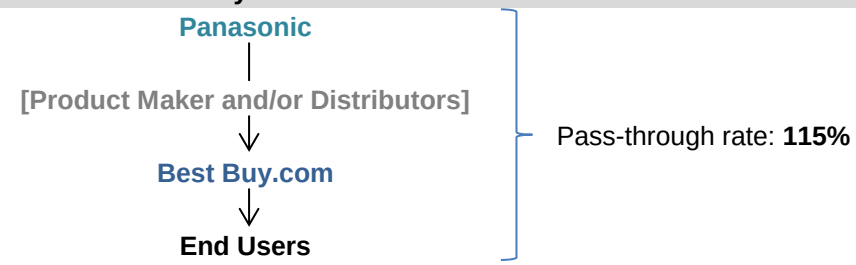
A tube manufacturer increases its prices by $1.00.

A retailer increases TV/monitor prices by $1.20 in response to price increases upstream.

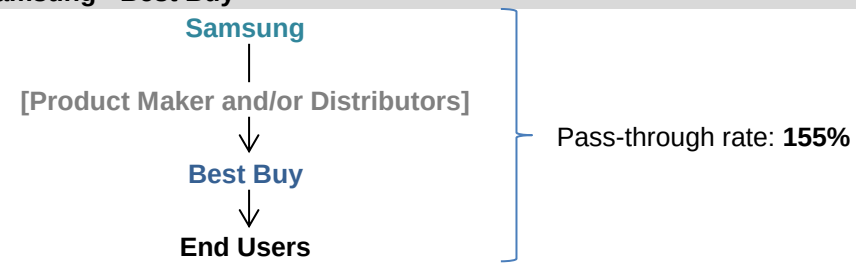
End users who purchase a TV or monitor face a price increase of $1.20 as a result of the $1.00 tube price increase; the top-and-bottom pass-through rate is **120%.**

Top-and-Bottom Pass-Through Study Results

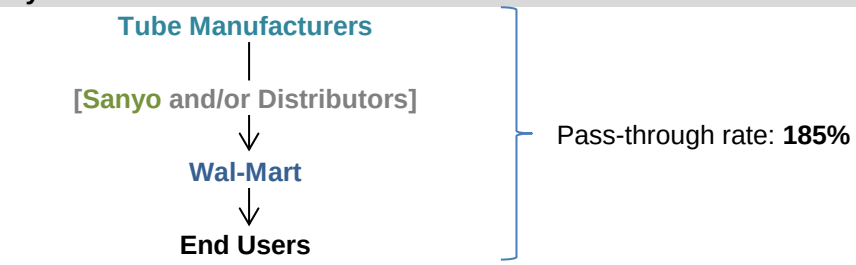
Panasonic - Best Buy.com



Samsung - Best Buy



Sanyo - Wal-Mart



Note(s):
The Sanyo - Wal-Mart top-and-bottom study uses Sanyo tube purchase data that include tubes from many manufacturers.
Pass-through rates rounded to the nearest percent.

Source File(s):
panasonic_bestbuy_com_TAB_report.do
samsung_bestbuy_TAB_report.do
sanyo_combined_report.do
See Exhibit 71

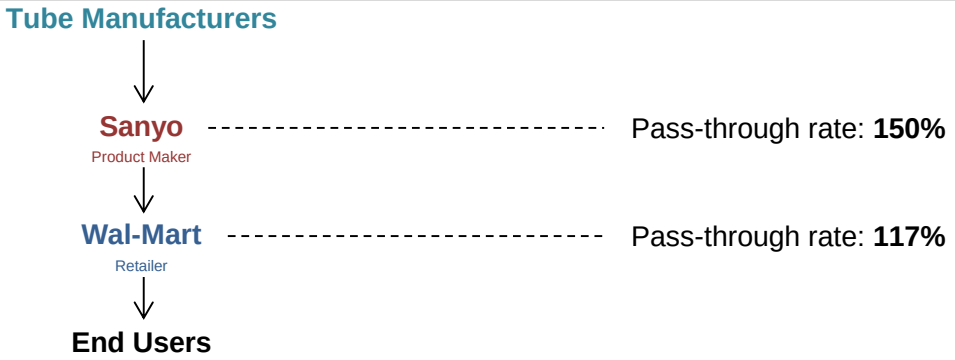
Top-to-Bottom Pass-Through Study Results

Toshiba



Cumulative pass-through rate: 101% * 174% * 104% = **183%**

Sanyo - Wal-Mart



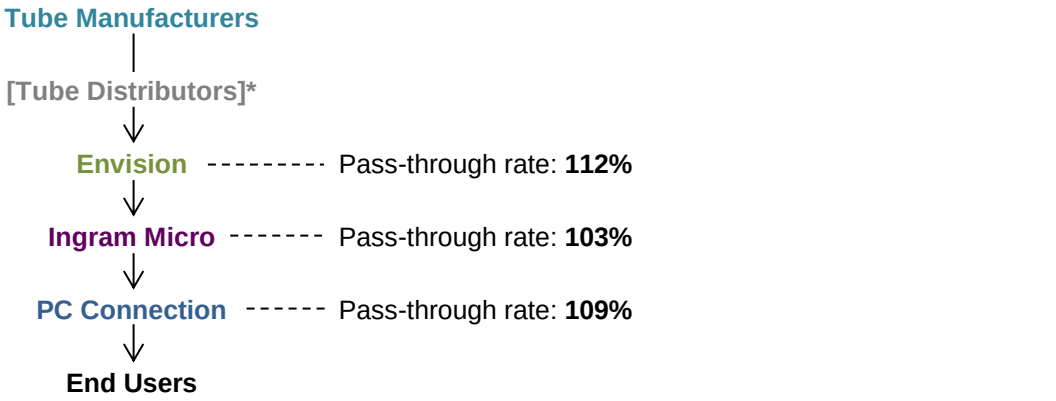
Cumulative pass-through rate: 150% * 117% = **176%**

Note(s):
The Sanyo - Wal-Mart study uses Sanyo tube purchase data that include tubes from many manufacturers.
Pass-through rates are rounded to the nearest percent.

Source File(s):
sanyo_combined_report.do
toshiba_top_to_bottom.do
See Exhibit 71

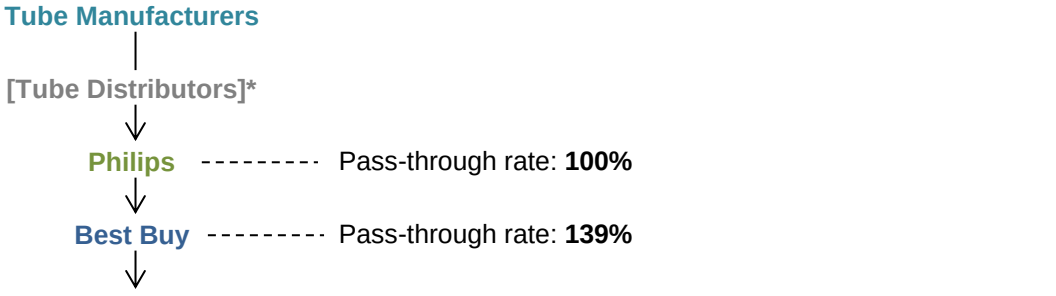
Multi-Level Pass-Through Study Results

Envision - Ingram Micro - PC Connection



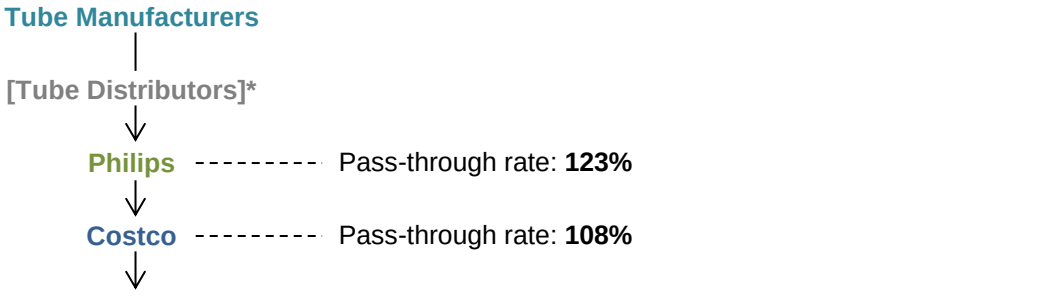
Cumulative pass-through rate: 112% * 103% * 109% = **127%**

Philips - Best Buy



Cumulative pass-through rate: 100% * 139% = **139%**

Philips - Costco



Cumulative pass-through rate: 123% * 108% = **133%**

Note(s):
* Tube distributors may not be present in the distribution chain.
Pass-through rates are rounded to the nearest percent.

Source File(s):
envision_im_pcc_report.do
philips_costco_report.do
philips_bestbuy_report.do
See Exhibit 71

Pass-Through Stata File List

Study Name	Stata Program Names
Amazon	Import Amazon Specs.do amazon_data_cleaning.do amazon_report.do
Arrow	arrow_data_cleaning.do arrow_report.do
BenQ	benq_customer_list.do benq_data_cleaning.do benq_report.do
Best Buy	bestbuy_sku_list.do bestbuy_data_load.do bestbuy_20100128_production_load.do bestbuy_20121024_production_load.do bestbuy_data_cleaning.do bestbuy_report.do
Best Buy.com	bestbuy_com_data_load.do bestbuy_com_data_clean.do bestbuy_com_report.do
Buy.com	Import BuyCom Digests.do ReadSKUs.do buycom_data_cleaning.do buycom_report.do
CDW	cdw_data_cleaning.do cdw_report.do
Costco	costco_data_load.do costco_data_cleaning.do costco_report.do
Dell	dell_data_cleaning.do dell_report.do
Envision	envision_data_cleaning.do envision_report.do
Fry's	frys_data_cleaning.do frys_report.do
Funai	funai_data_cleaning.do funai_report.do
Gateway	gateway_data_cleaning.do gateway_report.do
Ingram Micro	ingram_micro_data_load.do ingram_micro_data_cleaning.do ingram_micro_report.do
Kmart	kmart_data_load.do kmart_data_clean.do kmart_report.do
OfficeMax	item_selection.do officemax_data_cleaning.do officemax_report.do

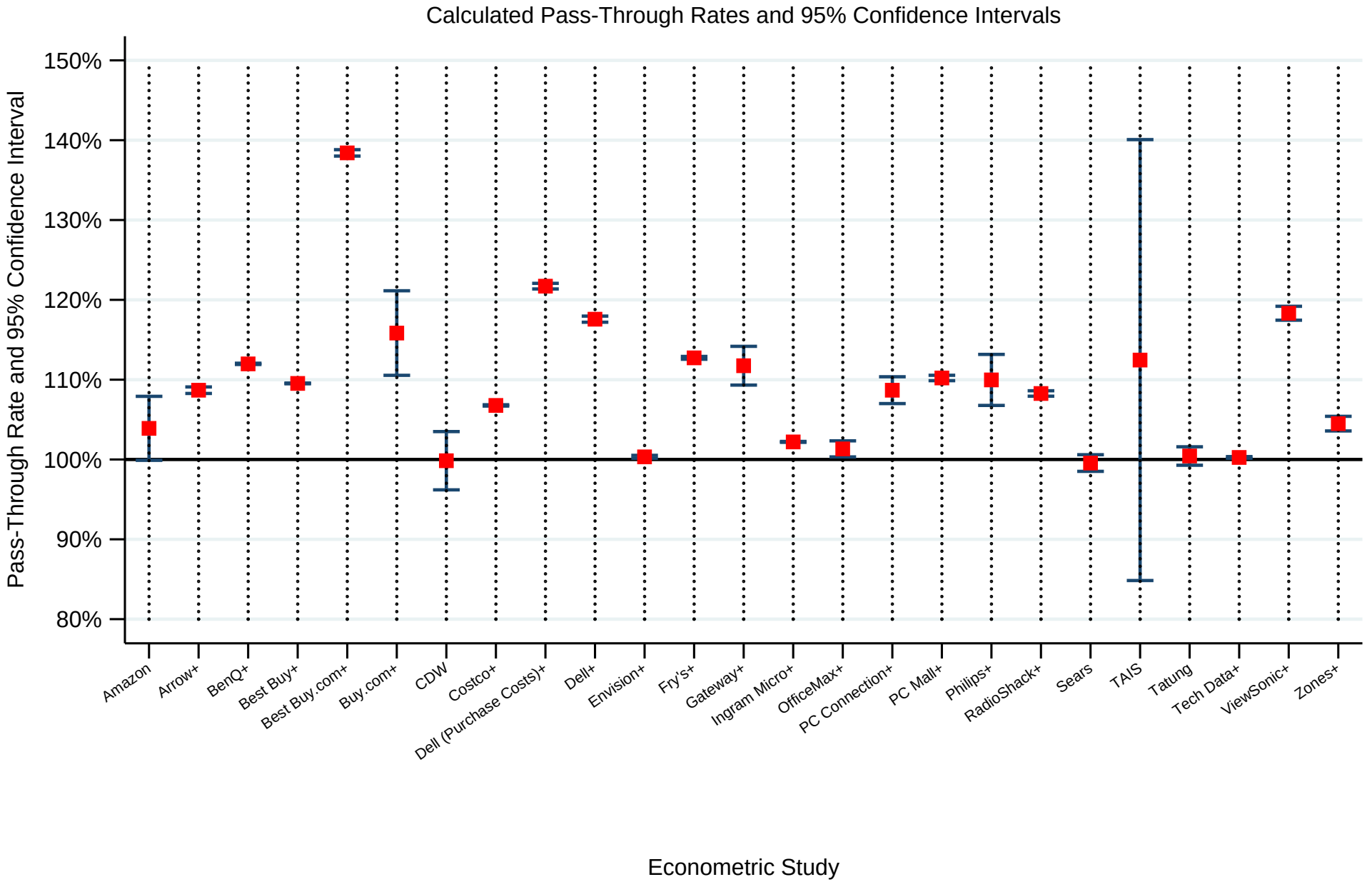
Study Name	Stata Program Names
PC Connection	pcconnection_data_cleaning.do pcconnection_report.do
PC Mall	pcmall_data_cleaning.do pcmall_report.do
RadioShack	radioshack_data_load.do radioshack_data_clean.do radioshack_report.do
Sam's Club (Retail Prices)	selected_stores.do selected_items.do additional_wm_sams_skus.do sams_retail_prices.do sams_retail_prices_report.do
Sam's Club (Transaction Prices)	selected_stores.do selected_items.do additional_wm_sams_skus.do sams_data_cleaning.do sams_report.do
Sanyo	sanyo_data_combine.do sanyo_combined_report.do
Sears	sears_data_load.do sears_data_clean.do sears_add_date.do sears_report.do
Target	target_data_clean.do target_report.do
Tatung	tatung_costs.do tatung_sales.do tatung_report.do
Tech Data	techdata_data_cleaning.do techdata_report.do
Toshiba America Consumer Products (TACP)	tacp_sales_load.do tacp_sales_clean.do tacp_report.do
Toshiba America Electronic Components (TAEC)	taec_data_load.do taec_report.do
Toshiba America Information Systems (TAIS)	tais_sales.do tais_report.do
ViewSonic	viewsonic_data_cleaning.do viewsonic_report.do
Wal-Mart (Retail Prices)	selected_stores.do selected_items.do additional_wm_sams_skus.do walmart_retail_prices.do walmart_retail_prices_report.do
Wal-Mart (Transaction Prices)	selected_stores.do selected_items.do additional_wm_sams_skus.do walmart_data_cleaning.do

Study Name	Stata Program Names
	walmart_report.do
Wal-Mart/Sanyo	sanyo_data_cleaning.do sanyo_report.do
Zones	zones_item_selection.do zones_data_cleaning.do zones_report.do
Multi-Level: Envision - Ingram Micro - PC Connection	envision_data_cleaning.do ingram_micro_data_load.do ingram_micro_data_cleaning.do pcc_clean_ingram_envision_only.do envision_im_pcc_merge.do envision_im_pcc_report.do
Multi-Level: Philips - Best Buy	bestbuy_sku_list.do bestbuy_data_load.do bestbuy_20100128_production_load.do bestbuy_20121024_production_load.do bestbuy_data_cleaning.do philips_data_load.do philips_data_clean.do philips_bestbuy_load_clean.do philips_bestbuy_report.do
Multi-Level: Philips - Costco	costco_data_load.do costco_philipsonly_clean.do philips_data_load.do philips_data_clean.do philips_costco_clean.do philips_costco_report.do
Top-and-Bottom: Panasonic - Best Buy.com	bestbuy_com_data_load.do bestbuy_com_data_clean.do MTPD-0122906.do panasonic_bestbuy_com_TAB_clean.do panasonic_bestbuy_com_TAB_report.do
Top-and-Bottom: Samsung - Best Buy	bestbuy_sku_list.do bestbuy_data_load.do bestbuy_20100128_production_load.do bestbuy_20121024_production_load.do bestbuy_data_cleaning.do SDCRT-0083119.2.do samsung_bestbuy_tab_load.do samsung_bestbuy_tab_clean.do samsung_bestbuy_tab_report.do
Top-and-Bottom: Sanyo - Wal-Mart	sanyo_data_cleaning.do sanyo_data_combine.do sanyo_combined_report.do
Top-to-Bottom: Sanyo - Wal-Mart	sanyo_data_cleaning.do sanyo_data_combine.do sanyo_combined_report.do

Study Name	Stata Program Names
Top-to-Bottom: Toshiba	taec_data_load.do tacp_sales_load.do tacp_sales_clean.do costco_data_load.do costco_data_cleaning.do toshiba_top_to_bottom.do

Note(s):
Programs are listed in the order they should be run.

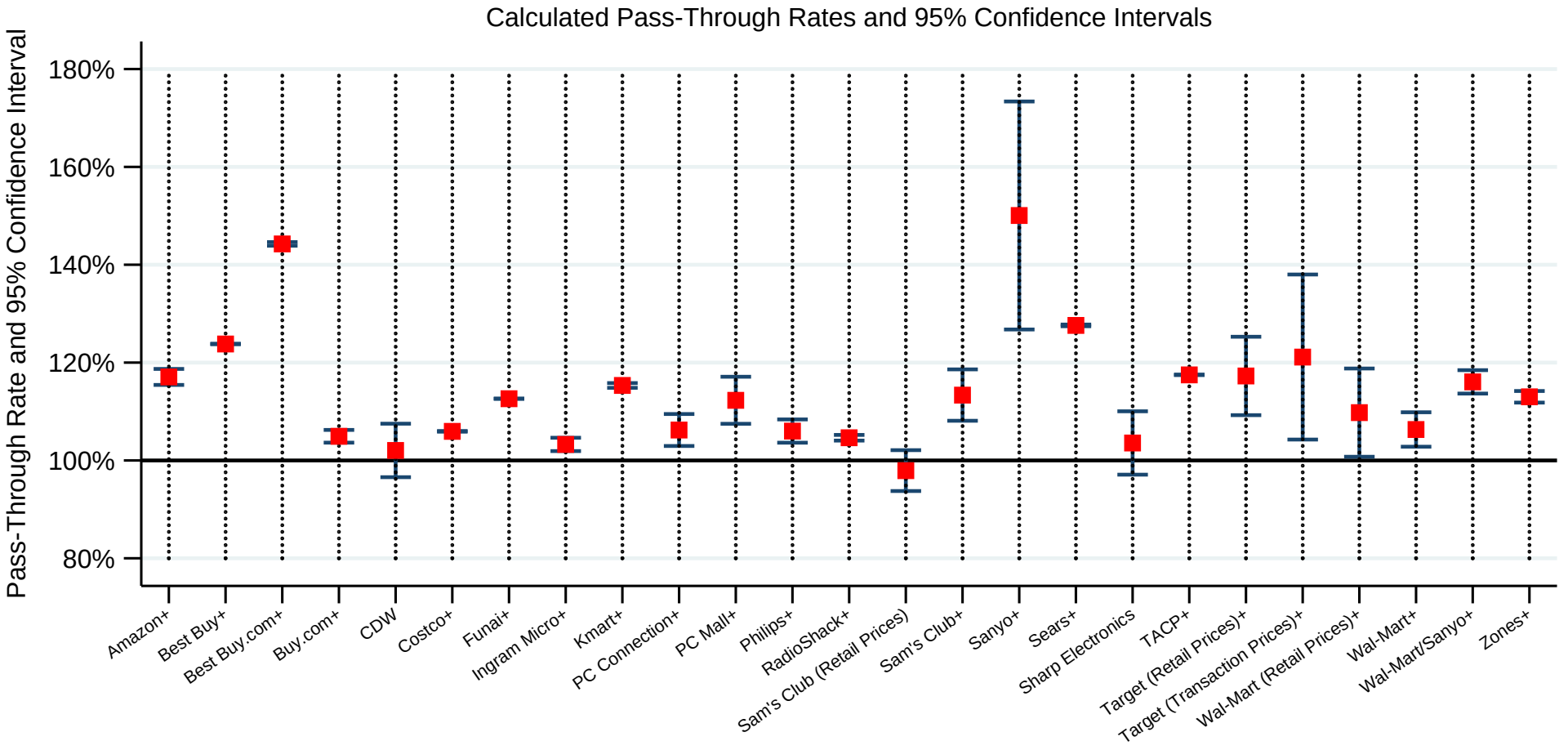
Monitor Pass-Through



Note: + The pass-through rate is statistically greater than 100%.
Source Files: See Exhibit 71.

Exhibit 72

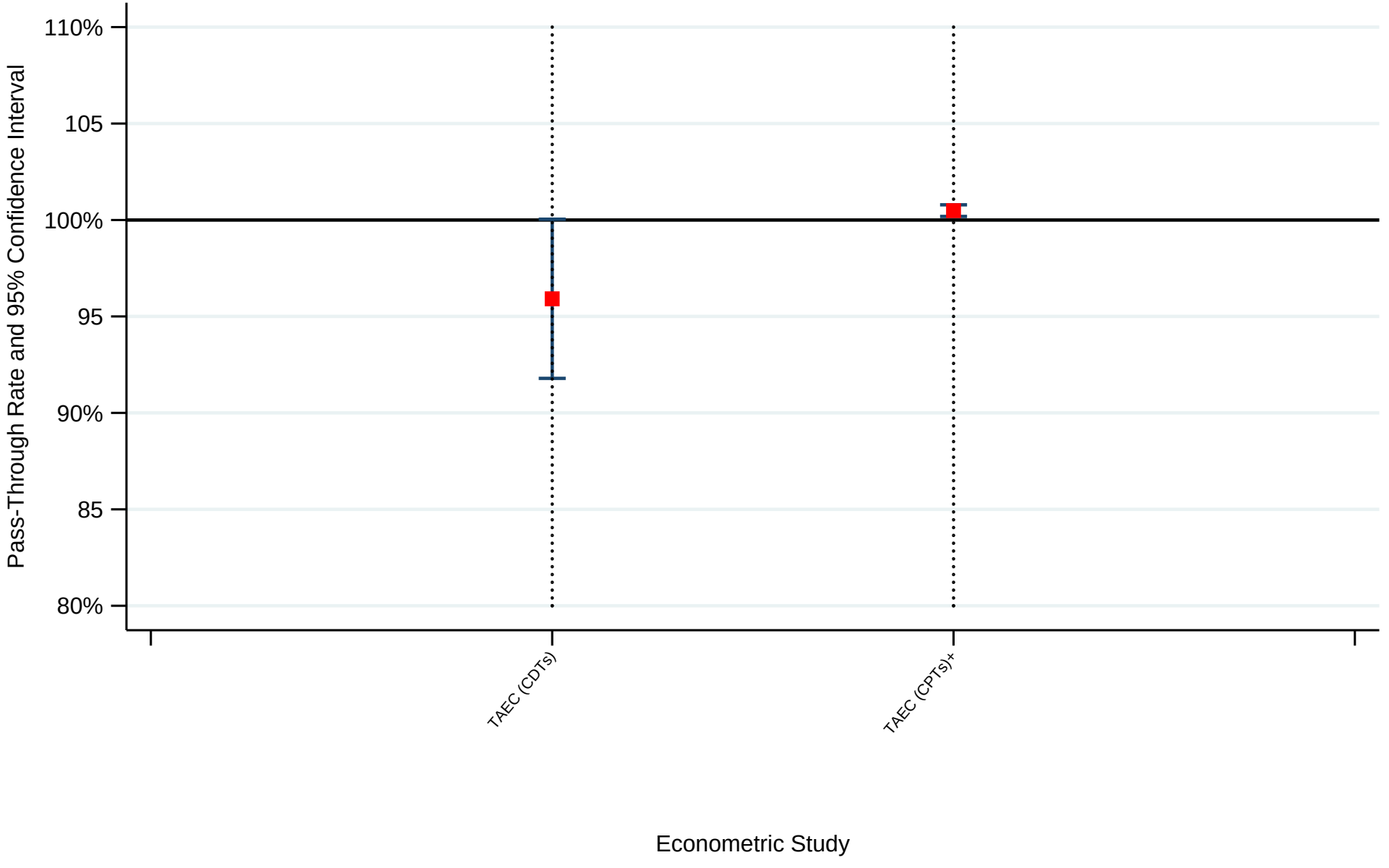
Television Pass-Through



Note: + The pass-through rate is statistically greater than 100%.
Source Files: See Exhibit 71.

Exhibit 73

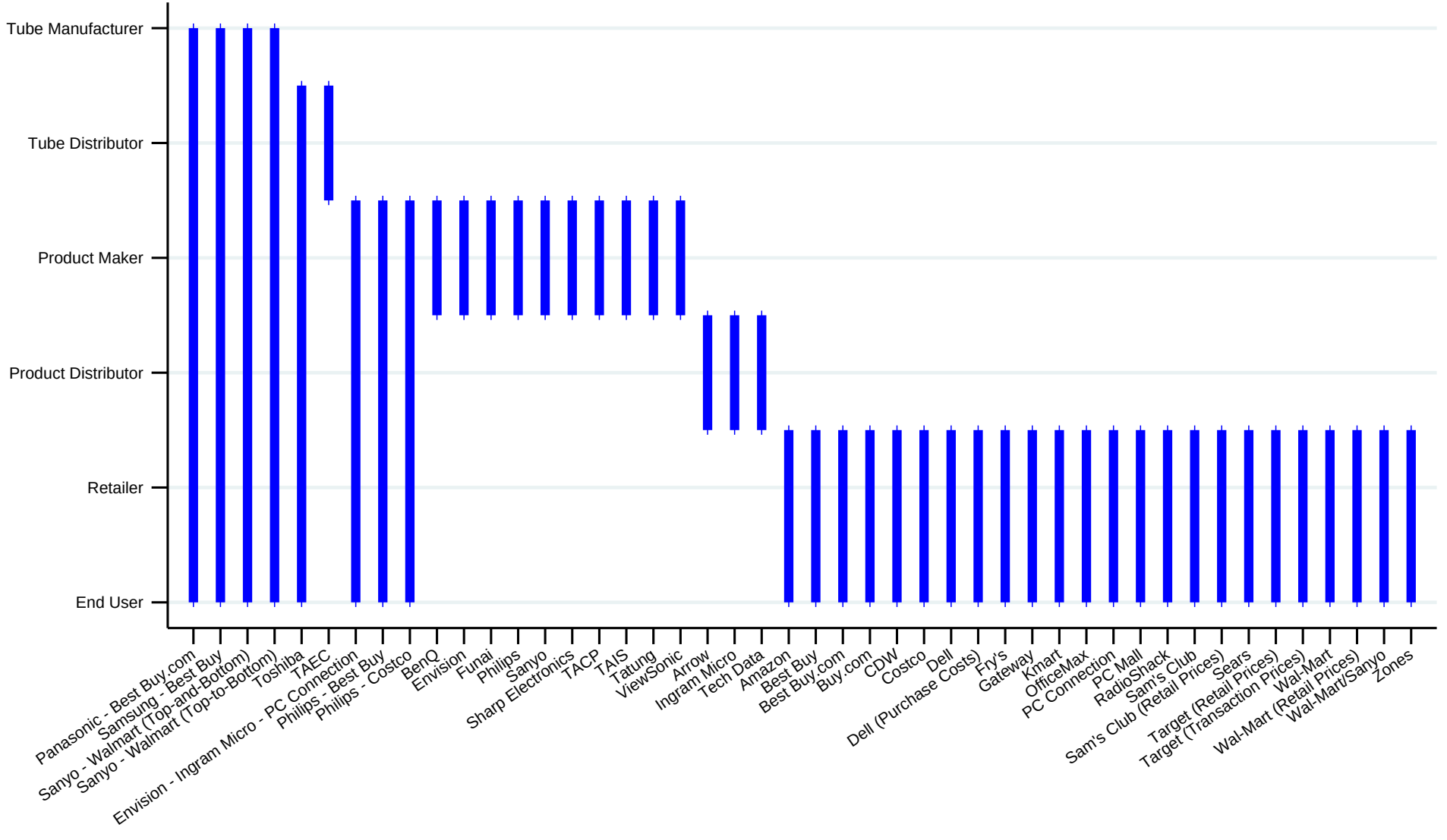
Tubes Pass-Through



Note: + The pass-through rate is statistically greater than 100%.
Source Files: See Exhibit 71.

Exhibit 74

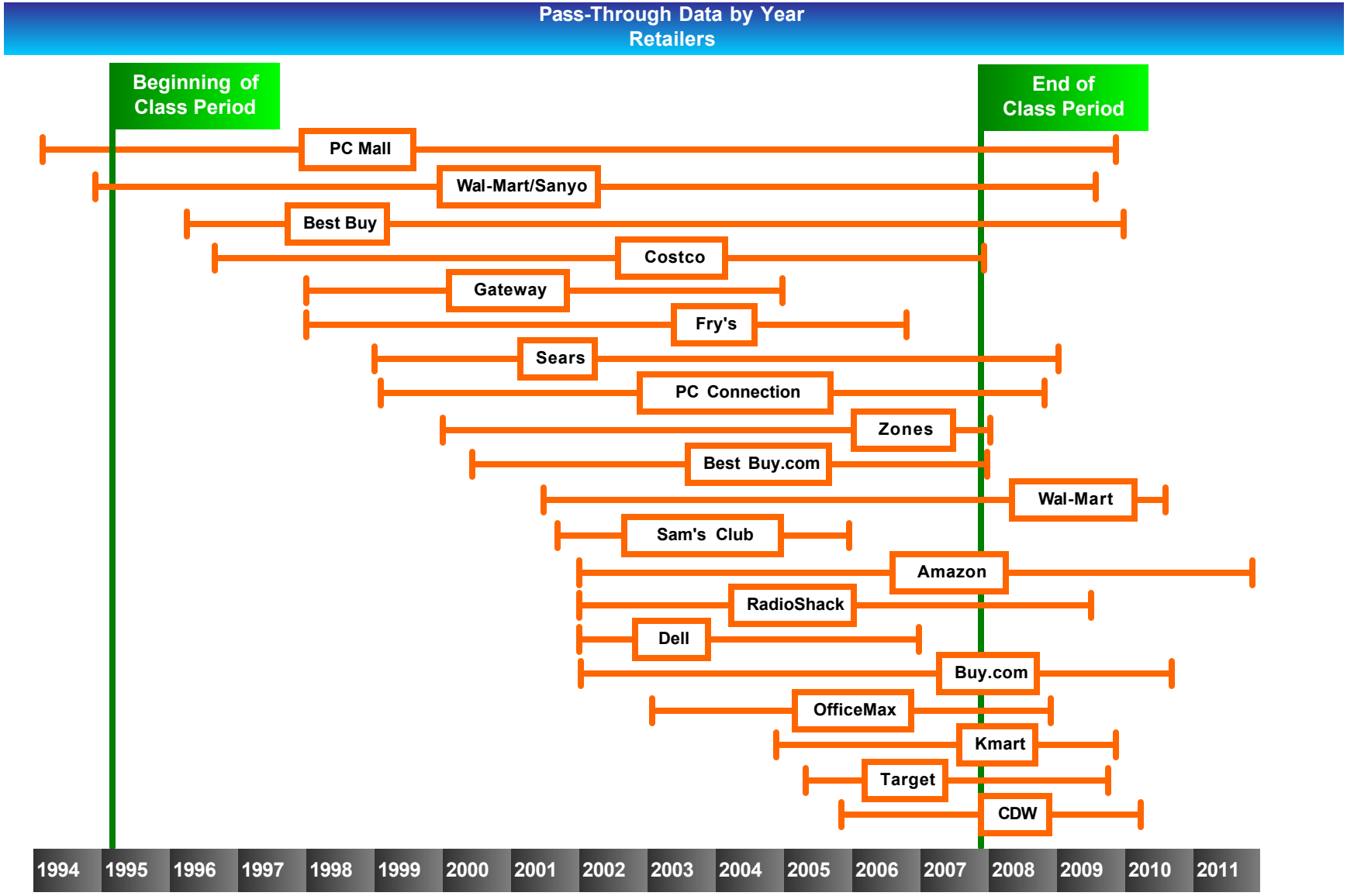
Pass-Through Studies Channel Coverage



Econometric Study

Source Files: See Exhibit 71.

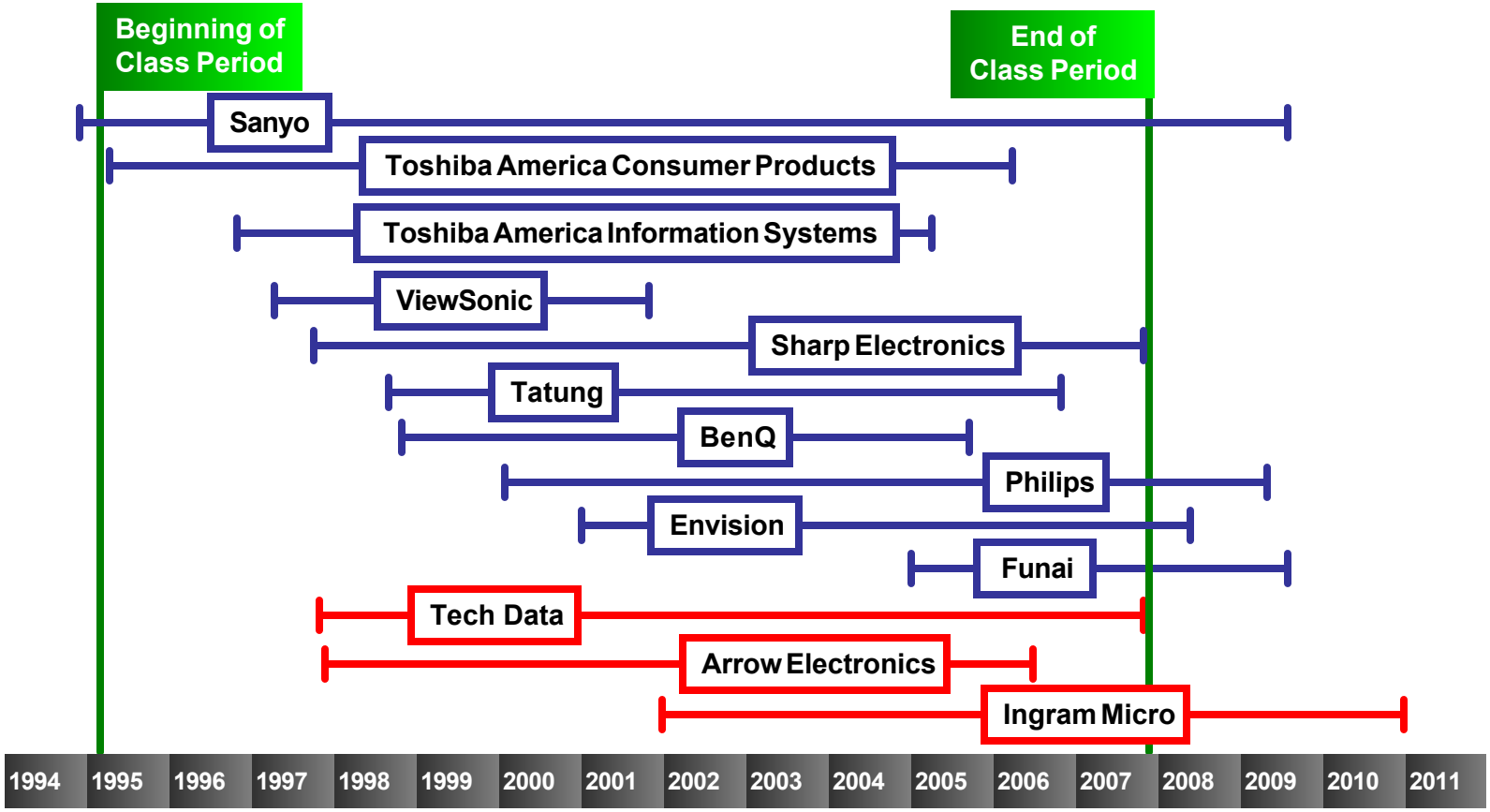
Exhibit 75



Source File(s):
See Exhibit 71.

Exhibit 76

Pass-Through Data by Year
Product Makers and Product Distributors

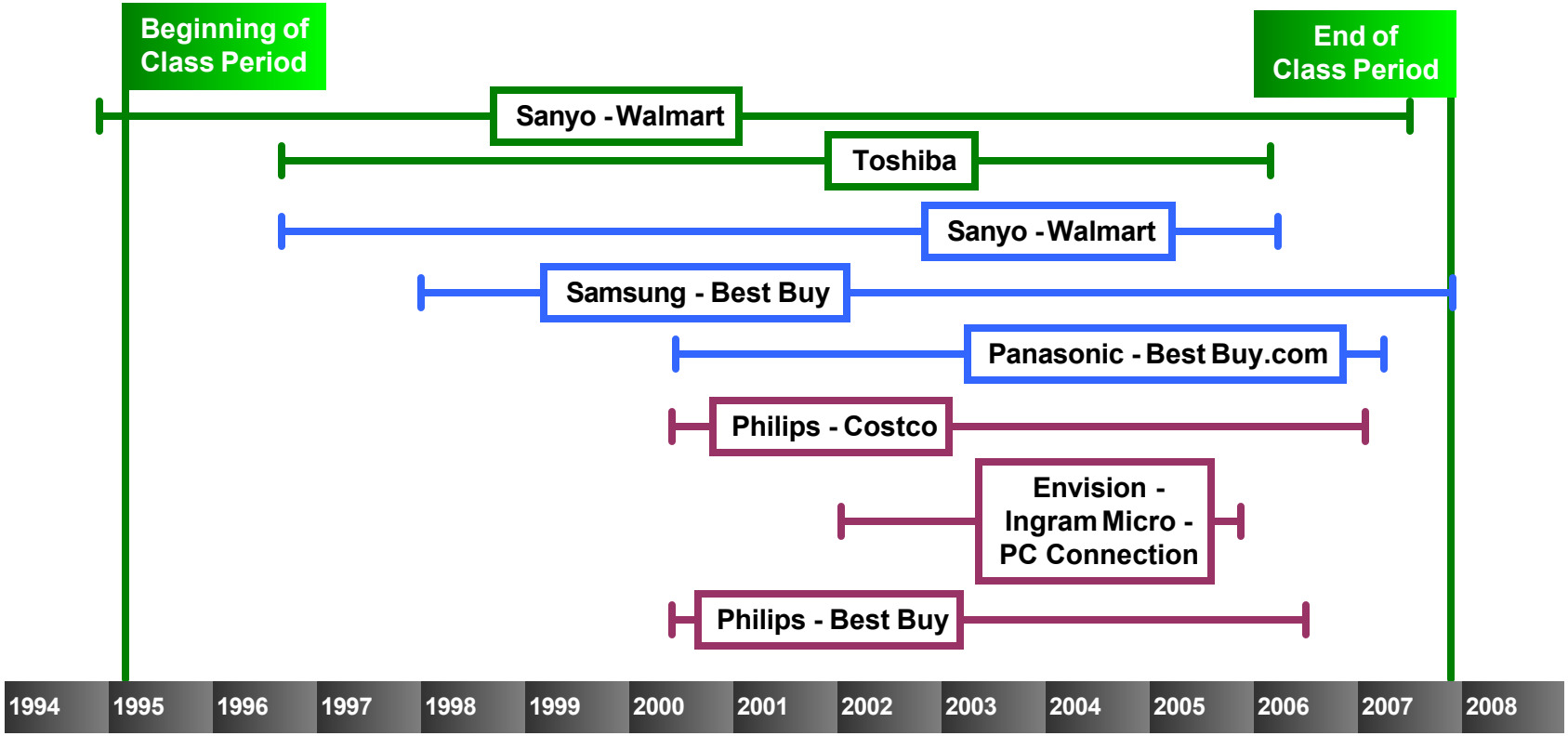


Note(s):
Blue indicates product makers.
Red indicates product distributors.

Source File(s):
See Exhibit 71.

Exhibit 77

Pass-Through Data by Year
Top-and-Bottom, Top-to-Bottom, and Multi-Level Studies



Note(s):
Blue indicates top-and-bottom studies.
Green indicates top-to-bottom studies.
Purple indicates multi-level studies.

Source File(s):
See Exhibit 71.

Exhibit 78

Class Share of Worldwide CRT Revenues

Year	North American Share of Worldwide Sales		U.S. Share of North America	Non-Government Share of U.S.	Class States' Share of U.S.	Class Members' Share of Worldwide Sales	
	CDT	CPT				CDT	CPT
1995	38.7%	17.2%	92.3%	92.8%	44.9%	14.9%	6.6%
1996	38.7%	17.2%	92.5%	92.8%	44.9%	14.9%	6.6%
1997	38.7%	17.2%	92.4%	93.4%	44.9%	15.0%	6.7%
1998	38.7%	17.2%	92.5%	93.5%	45.0%	15.0%	6.7%
1999	38.7%	17.8%	92.6%	93.0%	45.0%	15.0%	6.9%
2000	37.6%	16.0%	92.8%	93.6%	45.2%	14.7%	6.3%
2001	33.9%	15.8%	92.8%	93.8%	45.2%	13.3%	6.2%
2002	33.9%	15.5%	92.7%	92.6%	45.2%	13.2%	6.0%
2003	28.0%	15.2%	92.7%	92.9%	45.3%	10.9%	5.9%
2004	27.6%	14.9%	92.8%	92.9%	45.3%	10.8%	5.8%
2005	20.3%	14.3%	92.7%	93.5%	45.4%	8.0%	5.6%
2006	12.4%	12.0%	92.6%	93.3%	45.4%	4.9%	4.7%
2007	6.9%	5.1%	92.5%	93.2%	45.3%	2.7%	2.0%
Average	35.6%	15.6%	92.6%	93.2%	45.1%	13.8%	6.1%

Note(s): Averages are revenue-weighted across all years.

Data Source(s): See Exhibit 84.

Source File(s): total_damages_exhibits.xlsx
total_damages_exhibits.do
total_damages.do
quantity_database.do
average_price.do
class_shares.do
cdt_size_share.do
cpt_size_share.do
defendant_cdt_share.do
defendant_cpt_share.do
worldwide_production.do
total production.do
dta creator.do

Class CRT Expenditures by Product Type and Defendant Status

Year	CDT Expenditures by Class Members			CPT Expenditures by Class Members			Total Expenditures by Class Members
	Defendants	Co-conspirators	Total	Defendants	Co-conspirators	Total	
1995	961,205,077	26,884,116	988,089,193	553,717,400	99,775,612	653,493,012	1,641,582,205
1996	1,282,560,433	73,443,349	1,356,003,782	735,477,070	132,749,575	868,226,645	2,224,230,427
1997	1,135,139,290	64,340,442	1,199,479,732	724,676,235	130,406,330	855,082,565	2,054,562,297
1998	935,195,531	43,861,623	979,057,154	695,134,165	126,032,051	821,166,215	1,800,223,370
1999	1,142,447,326	57,027,028	1,199,474,354	680,928,263	116,987,597	797,915,860	1,997,390,213
2000	1,217,064,212	98,015,652	1,315,079,864	642,518,554	173,050,491	815,569,045	2,130,648,908
2001	663,213,636	35,224,194	698,437,830	580,235,022	110,977,776	691,212,798	1,389,650,629
2002	562,837,894	22,395,828	585,233,722	515,780,130	110,640,257	626,420,387	1,211,654,109
2003	330,084,825	9,657,293	339,742,118	511,130,700	107,144,743	618,275,442	958,017,560
2004	320,351,705	2,562,904	322,914,610	549,081,791	90,043,368	639,125,159	962,039,769
2005	153,611,074	0	153,611,074	417,717,958	66,326,671	484,044,628	637,655,702
2006	56,079,170	0	56,079,170	288,354,349	46,095,121	334,449,470	390,528,640
2007	15,622,368	0	15,622,368	88,597,501	14,044,303	102,641,804	118,264,172
Total	**$ 8,775,412,542**	**$ 433,412,429**	**$ 9,208,824,971**	**$ 6,983,349,136**	**$ 1,324,273,893**	**$ 8,307,623,030**	**$ 17,516,448,001**

Note(s): Defendants include BMCC, Chunghwa, Daewoo/Orion, Hitachi, IRICO, LG Electronics, LPD, Matsushita, MTPD, Philips, Samsung, Samtel, Thai CRT, Toshiba, and Videocon/Technologies Displays. Co-conspirators include Mitsubishi, Thomson, and Videocon.

Data Source(s): See Exhibit 84.

Source File(s): total_damages_exhibits.xlsx
total_damages_exhibits.do
total_damages.do
quantity_database.do
average_price.do
class_shares.do
cdt_size_share.do
cpt_size_share.do
defendant_cdt_share.do
defendant_cpt_share.do
worldwide_production.do
total production.do
dta creator.do

Nominal Damages Suffered by Class Members

Year	CDT Damages			CPT Damages			Total Damages
	Defendants	Co-conspirators	Total	Defendants	Co-conspirators	Total	
1995	239,930,684	6,710,664	246,641,348	52,405,565	9,443,079	61,848,644	308,489,993
1996	320,145,627	18,332,522	338,478,149	69,607,875	12,563,839	82,171,714	420,649,863
1997	283,347,178	16,060,305	299,407,483	68,585,650	12,342,067	80,927,717	380,335,200
1998	233,438,325	10,948,495	244,386,821	65,789,695	11,928,072	77,717,766	322,104,587
1999	285,171,370	14,234,771	299,406,140	64,445,203	11,072,076	75,517,279	374,923,420
2000	303,796,823	24,466,124	328,262,947	60,809,987	16,378,045	77,188,032	405,450,980
2001	165,547,712	8,792,468	174,340,180	54,915,277	10,503,288	65,418,564	239,758,745
2002	140,492,476	5,590,322	146,082,798	48,815,062	10,471,344	59,286,406	205,369,204
2003	82,393,945	2,410,600	84,804,545	48,375,025	10,140,517	58,515,542	143,320,087
2004	79,964,417	639,738	80,604,155	51,966,836	8,521,989	60,488,825	141,092,981
2005	38,343,545	0	38,343,545	39,534,148	6,277,366	45,811,514	84,155,059
2006	13,998,172	0	13,998,172	27,290,767	4,362,588	31,653,355	45,651,527
2007	1,915,358	0	1,915,358	2,799,726	443,807	3,243,533	5,158,891
Total	**$ 2,188,485,633**	**$ 108,186,008**	**$ 2,296,671,641**	**$ 655,340,815**	**$ 124,448,077**	**$ 779,788,893**	**$ 3,076,460,534**

Note(s): Defendants include BMCC, Chunghwa, Daewoo/Orion, Hitachi, IRICO, LG Electronics, LPD, Matsushita, MTPD, Philips, Samsung, Samtel, Thai CRT, Toshiba, and Videocon/Technologies Displays. Co-conspirators include Mitsubishi, Thomson, and Videocon.

Data Source(s): See Exhibit 84.

Source File(s): total_damages_exhibits.xlsx
total_damages_exhibits.do
total_damages.do
quantity_database.do
average_price.do
class_shares.do
cdt_size_share.do
cpt_size_share.do
defendant_cdt_share.do
defendant_cpt_share.do
worldwide_production.do
total production.do
dta creator.do

CRT Production and Market Shares Data Sources

	Dates Used	Tube Type Used	Subdivision	Granularity
Defendant Production				
Hitachi Displays, 2002, Untitled Spreadsheet, HDP-CRT00019322.	H1 1991 - H2 1999	CPT, CDT	Industry total quantities; Hitachi total quantities	Semi-annually
MT Picture Display, November 2006, Untitled Spreadsheet, MTPD-0416090.	Q1 2000 - Q4 2006	CPT	Quantities by Manufacturer	Quarterly
Samsung, 11 December 2003, Worldwide CDT Manufacturer's Status, SDCRT-0201291.	Q1 1998 - Q4 2000	CDT	Quantities by Manufacturer	Quarterly
Undated, CDT maker sales, CHU00071226.	Q1 - Q4 2001	CDT	Quantities by Manufacturer	Quarterly
Third Party				
DisplaySearch, 2003, DisplaySearch Quarterly Desktop Monitor Shipment and Forecast Report Q1'03, CHWA00106460 - CHWA00106757.	Q1 - Q4 2002	CDT	By Manufacturer	Quarterly
DisplaySearch, 2003, Quarterly Desktop Monitor Shipment and Forecast Report, CHWA00062147 - CHWA00062569.	Q1 - Q4 2003	CDT	By Manufacturer	Quarterly
DisplaySearch, 07 July 2005, Q2'05 Quarterly Desktop Monitor Shipment and Forecast Report, CHWA00088192 - CHWA00088762.	Q2 2004 - Q1 2005	CDT	By Manufacturer	Quarterly
DisplaySearch, 30 September 2005, Q3'05 Quarterly Desktop Monitor Shipment and Forecast Report, CHU00281352 - CHU00281923.	Q2 2005	CDT	Shares by Manufacturer; quantities by size	Quarterly
DisplaySearch, 30 March 2007, Q1'07 Quarterly Desktop Monitor Shipment and Forecast Report, CHU00154037 - CHU00154420.	Q3 2005 - Q4 2006	CDT	Shares by Manufacturer; quantities by size	Quarterly

Direct Overcharge Data Sources

CRT Price & Quantity Data

Defendant data; see Exhibit 64.

Demand Data

Organisation for Economic Co-operation and Development, 03 January 2014, Quarterly National Accounts, OECD.StatExtracts, http://stats.oecd.org/index.aspx?queryid=90#, accessed 03 January 2014.

Organisation for Economic Co-operation and Development, 03 January 2014, Key Short-Term Economic Indicators: Harmonised Unemployment Rate, OECD.StatExtracts, http://stats.oecd.org/index.aspx?queryid=21760, accessed 03 January 2014.

LCD Data

DisplaySearch, May 2011, Analysis Group, Inc. Custom Data Project, DISP_LCD_000129.

Glass Price Data

The Bank of Korea, Undated, Producer Price Indexes Bank of Korea, http://ecos.bok.or.kr/flex/EasySearch_e.jsp, accessed 10 October 2013.

Total Damages Data Sources

Worldwide quantity and Defendant market shares

CPT, Du, Ching-Yuan (Michael), 22 September 1995, Customer Contact Report, CHU00028305 - CHU00028310.
DisplaySearch, 07 July 2005, Q2'05 Quarterly Desktop Monitor Shipment and Forecast Report, CHWA00088192 - CHWA0008876,2 at 8484.
DisplaySearch, 2003, DisplaySearch Quarterly Desktop Monitor Shipment and Forecast Report Q1'03, CHWA00106460 - CHWA00106757, at 6730.
DisplaySearch, 2003, Quarterly Desktop Monitor Shipment and Forecast Report, CHWA00062147 - CHWA00062569, at 2427.
DisplaySearch, 30 March 2007, Q1'07 Quarterly Desktop Monitor Shipment and Forecast Report, CHU00154037 - CHU00154420, at 4389 - 4390.
DisplaySearch, 30 September 2005, Q3'05 Quarterly Desktop Monitor Shipment and Forecast Report, CHU00281352 - CHU00281923, at 1644 - 1645.
Hitachi Displays, 2002, Untitled Spreadsheet, HDP-CRT00019322.
LG Philips Displays, 02 December 2003, LG.Philips Displays to restructure its European industrial production infrastructure, PHLP-CRT-001323 - PHLP-CRT-001556, at 1370.
MT Picture Display, November 2006, Untitled Spreadsheet, MTPD-0416090, at Tab 'Supply DB'.
Samsung, 11 December 2003, Worldwide CDT Manufacturer's Status, SDCRT-0201291.
Undated, CDT maker sales, CHU00071226.

Class share of worldwide market

Census Bureau, 29 December 1999, 1990 to 1999 State Population Estimates, http://www.census.gov/popest/archives/1990s/ST-99-03.txt, accessed 22 May 2009
Census Bureau, December 2009, Population, population change and estimated components of population change: April 1, 2000 to July 1, 2009 (NST-EST2009-alldata), http://www.census.gov/popest/national/files/NST_EST2009_ALLDATA.csv, accessed 19 May 2011.
DisplaySearch, May 2011, Analysis Group, Inc. Custom Data Project, DISP_LCD_000129.
Japanese Electronics and IT Industries Association, June 2001, Worldwide CPT Demand by Area, HDP-CRT00057341.
OECD.StatExtracts, Undated, National Accounts, http://stats.oecd.org/Index.aspx?DataSetCode=SNA_TABLE1, accessed 01 October 2013.
Bureau of Economic Analysis, 28 April 2011, Final Sales of Domestic Computers, http://www.bea.gov/, accessed 01 October 2013.

Size-weighted average prices

all_defendants_dropexout_collapsed.dta. See Exhibit 64 for underlying sources.
28 August 2000, Philips Display Components North America: 1998 - 2002 Strategy Review, FOX00007278.
MT Picture Display, November 2006, Untitled Spreadsheet, MTPD-0416090, at Tab 'Supply DB'.
Samsung, 11 December 2003, Worldwide CDT Manufacturer's Status, SDCRT-0201291.
DisplaySearch, 30 March 2007, Q1'07 Quarterly Desktop Monitor Shipment and Forecast Report, CHU00154037 - CHU00154420, at 4389 - 4390.
DisplaySearch, 30 September 2005, Q3'05 Quarterly Desktop Monitor Shipment and Forecast Report, CHU00281352 - CHU00281923, at 1644 - 1645.
DisplaySearch, 07 July 2005, Q2'05 Quarterly Desktop Monitor Shipment and Forecast Report, CHWA00088192 - CHWA00088762, at 8484.

EXHIBIT 2

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Lead Counsel for the Indirect Purchaser Plaintiffs

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

IN RE: CATHODE RAY TUBE (CRT) ANTITRUST LITIGATION	Master File No. CV-07-5944 SC MDL No. 1917 **ERRATA TO THE EXPERT REPORT OF JANET S. NETZ, PH.D**
This document relates to: **ALL INDIRECT PURCHASER ACTIONS**	The Honorable Samuel Conti

Change the final paragraph in Section VIII.A.2.c)(5) (p. 39):

$13.43 on line three becomes $11.82

$3.60 on line four becomes $3.41

Replace Section XI.F (p.123) with:

I estimated a reduced-form price equation to identify the effect of the cartel on CRT prices. In addition to controlling for economic price determinants I included indicator variables that were equal to one during a portion of the cartel period and zero outside of the cartel period. The estimated coefficients on the indicator variables give an estimate of the percentage by which the cartel price was above the but-for (or competitive) price.

Before calculating damages, I adjust the estimates to account for the semi-log functional form of the estimation equation[1] and I convert the estimates to express the overcharge relative to the cartel price rather than relative to the but-for price.[2] The but-for CDT prices for 1995-2006 would have been 22.0% lower than the cartel price and for 2007 11.4% lower; the but-for CPT prices for 1995-2006 would have been 9.0% lower than the cartel price and for 2007 3.1% lower.

Damages to indirect purchaser class members were calculated as class expenditures multiplied by the overcharge rate relative to the cartel price multiplied by the pass-through rate. I calculated damages separately for each application type (CPTs and CDTs) as well as separately for two groups of CRT manufacturers, Defendants and Co-conspirators. The cartel imposed damages of $2.8 billion on class members; see Exhibit ER-81.

Replace Exhibit 81 with Exhibit ER-81.

[1] Kennedy, Peter E., September 1981, Estimation with Correctly Interpreted Dummy Variables in Semilogarithmic Equations, The American Economic Review, Volume 71, No. 4, 801. Specifically, the direct estimate on the cartel indicator coefficient, $\hat{\theta}$, was adjusted according to the formula: $\exp\left[\hat{\theta} - \frac{1}{2}\hat{V}(\hat{\theta})\right] - 1$, where exp denotes the exponential function and $\hat{V}$ denotes the estimated variance. Let the adjusted coefficient, which gives the overcharge rate relative to the but-for price, be denoted $\theta_{But-for}$.

[2] The overcharge rate relative to the cartel price, θ_{Cartel}, was obtained by the following conversion: $\theta_{Cartel} = \frac{\theta_{But-for}}{1+\theta_{But-for}}$.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief. This declaration was executed on the 3rd day of July 2014, at Ann Arbor, Michigan.

JANET S. NETZ

Subscribed and sworn to before me this 3rd day of July 2014.

Notary Public

BRIAN P ROSEWARNE
Notary Public - Michigan
Washtenaw County
My Commission Expires May 20, 2021
Acting in the County of _____

My commission expires: _____

Nominal Damages Suffered by Class Members

Year	CDT Damages			CPT Damages			Total Damages
	Defendants	Co-conspirators	Total	Defendants	Co-conspirators	Total	
1995	211,642,724	5,919,473	217,562,197	49,902,197	8,991,992	58,894,189	276,456,386
1996	282,400,281	16,171,107	298,571,388	66,282,767	11,963,676	78,246,443	376,817,831
1997	249,940,390	14,166,786	264,107,175	65,309,373	11,752,498	77,061,871	341,169,046
1998	205,915,818	9,657,662	215,573,480	62,646,979	11,358,278	74,005,257	289,578,736
1999	251,549,508	12,556,483	264,105,991	61,366,712	10,543,173	71,909,885	336,015,876
2000	267,979,010	21,581,554	289,560,564	57,905,147	15,595,681	73,500,828	363,061,392
2001	146,029,545	7,755,831	153,785,377	52,292,022	10,001,555	62,293,577	216,078,953
2002	123,928,335	4,931,220	128,859,556	46,483,209	9,971,137	56,454,346	185,313,901
2003	72,679,653	2,126,389	74,806,042	46,064,192	9,656,113	55,720,306	130,526,348
2004	70,536,568	564,313	71,100,881	49,484,426	8,114,901	57,599,327	128,700,208
2005	33,822,820	0	33,822,820	37,645,636	5,977,502	43,623,138	77,445,958
2006	12,347,779	0	12,347,779	25,987,111	4,154,191	30,141,302	42,489,081
2007	1,780,923	0	1,780,923	2,744,249	435,013	3,179,262	4,960,185
Total	**$ 1,930,553,355**	**$ 95,430,818**	**$ 2,025,984,173**	**$ 624,114,021**	**$ 118,515,708**	**$ 742,629,729**	**$ 2,768,613,903**

Note(s): Defendants include BMCC, Chunghwa, Daewoo/Orion, Hitachi, IRICO, LG Electronics, LPD, Matsushita, MTPD, Philips, Samsung, Samtel, Thai CRT, and Toshiba. Co-conspirators include Mitsubishi, Thomson, and Videocon.

Data Source(s): See Exhibit 84.

Source File(s): total_damages_exhibits.xlsx
total_damages_exhibits.do
total_damages.do
quantity_database.do
average_price.do
class_shares.do
cdt_size_share.do
cpt_size_share.do
defendant_cdt_share.do
defendant_cpt_share.do
worldwide_production.do
total production.do
dta creator.do

EXHIBIT 3

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

IN RE: CATHODE RAY TUBE (CRT) ANTITRUST LITIGATION This document relates to: ALL INDIRECT PURCHASER ACTIONS	Master File No. CV-07-5944-SC MDL No. 1917

EXPERT REPORT OF ROBERT D. WILLIG

8/5/14

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C. Dr. Netz's analysis of actual and target prices at most demonstrates a positive relationship between actual and target prices. It does not demonstrate that the alleged target prices had an impact on actual CPT prices. 24

D. Dr. Netz's hedonic regression analysis fails to establish that prices of CPTs that were not subject to the target prices she identifies were also elevated because of a "price structure" that links the prices of targeted and non-targeted CPTs. 26

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B. Dr. Netz's model implies an implausible pattern of CPT damages. 45

C. Dr. Netz's CPT overcharge estimates are inconsistent with available data on profit margins. 46

D. Dr. Netz provides no basis for her assumption that her estimated global CPT price overcharge is a reliable estimate of the overcharge paid by members of the IPP class in the U.S. 47

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I. Introduction

A. Qualifications

1. I am a Professor of Economics and Public Affairs at the Woodrow Wilson School and the Economics Department of Princeton University, USA. I am also a Senior Consultant at Compass Lexecon, an economics consulting firm based in the U.S. Previously, I was a Supervisor in the Economics Research Department of Bell Laboratories. My teaching and research have specialized in the fields of industrial organization, government-business relations, and welfare theory.

2. I have extensive experience analyzing economic issues arising under the law. From 1989 to 1991, I served as Chief Economist in the Antitrust Division of the U.S. Department of Justice, where I led the development of the 1992 *Horizontal Merger Guidelines*. I met with outsiders, weighed evidence, and participated in decisions on when to use enforcement power. Core to my work were issues pertaining to alleged conspiracies and market competition. I am the author of *Welfare Analysis of Policies Affecting Prices and Products* and *Contestable Markets and the Theory of Industry Structure* (with William Baumol and John Panzar) as well as numerous articles. I have served on the editorial boards of *The American Economic Review*, *The Journal of Industrial Economics*, and the *MIT Press Series on Regulation*. Also, I have served as a consultant and advisor to the Federal Trade Commission, the Department of Justice, the OECD, the Inter-American Development Bank, the World Bank, and the governments of many nations.

3. My curriculum vitae, which includes a list of my publications, is at Attachment 1. A list of matters in which I have given sworn testimony as an expert during the past four years, at trial or in deposition, is at Attachment 2.

B. Assignment

4. The Plaintiffs, a class of indirect purchasers ("IPPs"), allege that the manufacturers of color picture tubes ("CPTs") and color display tubes ("CDTs") acted in concert to elevate

prices of CPTs and CDTs between March 1, 1995 and November 25, 2007 (the class period).[1] I have been asked by counsel for several Defendants[2] to assess whether the economic analyses related to CPT damages provided by Dr. Janet Netz, the economic expert for the IPP class,[3] provide a reliable and sound basis to estimate damages to the IPP class.

5. In my report, I do not assess the impact (if any) of the alleged CPT cartel on the prices of televisions purchased by members of the IPP class during the class period. I understand that this assessment will be a subject of Professor Janusz Ordover's testimony in the instant litigation. My report will focus entirely on the impact of the putative CPT cartel on CPT prices.

[1] The named Defendants are: Panasonic Corporation, Panasonic Corporation of North America, MT Picture Display Co., Ltd.; Koninklijke Philips Electronics N.V., Philips Electronics North America Corporation, Philips Electronics Industries (Taiwan), Ltd.; Philips da Amazonia Industria Electronica Ltda.; Samsung SDI Co., Ltd., Samsung SDI America, Inc., Samsung SDI Mexico S.A. de C.V., Samsung SDI Brasil Ltda., Shenzhen Samsung SDI Co., Ltd., Tianjin Samsung SDI Co., Ltd, Samsung SDI (Malaysia) Sdn. Bhd.; Toshiba Corporation, Toshiba America, Inc., Toshiba America Consumer Products, L.L.C., Toshiba America Information Systems, Inc., Toshiba America Electronic Components, Inc.; Beijing-Matsushita Color CRT Company; Hitachi, Ltd., Hitachi Displays, Ltd. (n/k/a Japan Display Inc.), Hitachi America, Ltd., Hitachi Asia, Ltd., Hitachi Electronic Devices (USA), Inc.; P.T. Tosummit Electronic Devices Indonesia; IRICO; Thai CRT Co.; Samtel Color, Ltd.; Shenzhen SEG Hitachi Color Display Devices, Ltd.; and LP Displays International.

[2] I have been retained by Winston & Strawn LLP representing Panasonic Corporation of North America, MT Picture Display Co., Ltd., and Panasonic Corporation (f/k/a Matsushita Electrical Industrial Co.); Kirkland & Ellis LLP representing Hitachi, Ltd., Hitachi Asia, Ltd., Hitachi America, Ltd., Hitachi Electronic Devices (USA), Inc., and Hitachi Displays, Ltd. (n/k/a Japan Display Inc.) (collectively, the "Hitachi Defendants" or "Hitachi"); White & Case LLP representing Toshiba America Consumer Products, L.L.C., Toshiba America Electronic Components, Inc., Toshiba America, Inc., Toshiba America Information Systems, Inc., and Toshiba Corporation; Sheppard, Mullin, Richter & Hampton LLP representing Samsung SDI America, Inc., Samsung SDI Co. Ltd., Samsung SDI (Malaysia) Sdn. Bhd., Samsung SDI Mexico S.A. De C.V., Samsung SDI Brasil Ltda., Shenzen Samsung SDI Co., Ltd., and Tianjin Samsung SDI Co., Ltd.; and Baker Botts LLP representing Koninklijke Philips N.V., Philips Electronics North America Corporation, Philips Taiwan Limited, and Philips do Brasil Ltda.

[3] Expert Report of Janet S. Netz, Ph.D., April 15, 2014 (hereafter "Netz Damages Report").

6. A list of the information and data I have relied upon in forming the opinions expressed herein is attached at Attachment 3. My opinions expressed herein are based on those materials and data, my analyses and opinions explained in the three expert reports that I have filed in the class-certification stage of the instant litigation,[4] my knowledge and experience in industrial organization economics and antitrust economics, my experience in antitrust enforcement at the Department of Justice, and my experience in advising and consulting with clients on competition matters over the past 35 years, both here and abroad.

7. The opinions expressed in this report reflect the information and facts I believe to be true at the time this report is filed. I reserve the right to revise my opinions if additional information and facts supplied in discovery or through subsequent expert reports and depositions make such revisions appropriate.

8. Compass Lexecon is being compensated for my work at my usual hourly rate of $1350, which is the same rate for research and testimony. This compensation is in no way connected to the outcome of this litigation.

II. Summary of Conclusions

9. I have reached the following conclusions in this matter:

a) Market conditions for CPTs differed materially from conditions for CDTs. As such, it makes economic sense to analyze the impact and damages of the alleged cartel separately for CPTs and CDTs.

b) Salient characteristics of the CPT industry were not conducive to effective and sustained class-wide elevations of CPT prices resulting from collusion.

c) Defendants' conduct was inconsistent with a sustained and effective CPT cartel.

[4] Expert Report of Robert D. Willig, Indirect Purchaser Class Action, December 17, 2012, Rebuttal Declaration of Robert D. Willig, Indirect Purchaser Class Action, March 25, 2013, and Expert Report of Robert D. Willig, Direct Purchaser Class Action, September 10, 2013 (hereafter "Willig Class Action Reports").

d) Straightforward evidence on CPT prices, margins and capacity do not support Dr. Netz's claim of a highly successful CPT cartel.

e) Dr. Netz's model of CPT overcharges undermines her claim that the alleged cartel had a class-wide impact because it finds potentially no damages after 1997 and potentially no damages for large CPTs.

f) Dr. Netz's model of CPT overcharges is fundamentally unreliable and does not validly support a claim of substantial overcharges. In particular, Dr. Netz's model crucially assumes that the model includes all material economic determinants of CPT prices and also that the underlying relationships between the economic factors and CPT prices did not change materially during the 18-year estimation period. As such, the model assumes that the only reason (after controlling for the included economic factors) that prices were higher during the class period is the alleged collusive conduct by manufacturers. However, standard tests show that relationships between CPT prices and the economic variables included in Dr. Netz's model were not at all stable during the 18-year period (consistent with dramatically changing market conditions for CPTs). Moreover, the model excludes basic economic determinants (such as product quality) of CPT prices. For both these reasons, Dr. Netz's model produces completely unreliable estimates of collusive overcharges.

g) Despite these fundamental flaws, if Dr. Netz's model were to be used to estimate CPT overcharges, then her model should be modified to better control for changes in market conditions. Making reasonable modifications to her model to include relevant economic variables and better control for changes in market conditions result in an estimated CPT overcharge of 2.3% during the 1995-2006 period and a negative overcharge in 2007. Although these corrections improve Dr. Netz's model of CPT overcharges, they do not remedy the fundamental flaw described in this report.

10. Each of the above conclusions is explained in an associated section in the rest of this report, starting with the economic reasons for analyzing CPTs separately from CDTs.

III. It Makes Economic Sense to Analyze the Impact of the Alleged Cartel on CPTs Separately from CDTs.

11. I understand that CPTs were used predominantly in televisions, whereas CDTs were used predominantly in desktop computer monitors and were not used in televisions. The two were not substitutes from the standpoint of manufacturers of monitors and TVs (i.e., customers of CRT manufacturers) because of differences in resolution, electrical current

tolerances and brightness.[5] On the supply side, CDTs were manufactured mostly in Asia and shipped in monitors to consumer markets.[6] For example, about 10% of global CDT production occurred outside of Asia between 1998 and 2002, whereas about 50% of CPT production was outside Asia during the same period.[7] In contrast, the manufacture of CPTs and TVs was more geographically dispersed. For example, a majority of CPTs sold in North America were manufactured in North America during the class period.[8]

12. CPTs and CDTs were affected by differentiated market forces. For example, competition from LCDs impacted CRT monitors earlier and to a greater extent than CRT TVs.[9] The differential impact of LCDs on TVs and monitors is evident in Exhibit 1. Shares of CRT desktop monitors and TVs sold globally began to decline around 2000, but the decline was earlier and greater for CRT monitors. Exhibit 1 shows that CRT desktop monitors accounted for 91% of global desktop monitor sales in early 2001 but only 10% of such sales by the end of 2007. CRT TVs' share of global TV sales also

[5] I understand that CPTs and CDTs are characterized by several different properties. A key product feature of CPTs is high brightness, while CDTs are characterized by high resolution. The two CRT types also exhibit different mask and phosphor structures. (SDCRT-0021278-SDCRT-0021294 at 1288). Additionally, there is a tradeoff between the two products with regard to resolution and the power the CRT is able to withstand. CDTs are not able to withstand the current of a television due to their thin masks, which are needed to produce a high resolution, while CPTs do not have a high enough resolution to be used in monitors but are able to withstand a higher current than CDTs. (Deposition of Tatsuo Tobinaga, July 16-17, 2012 ("Tobinaga (Panasonic Corporation, PNA, MTPD) Deposition") p. 143.)

[6] See, e.g., Deposition of Sang-Kyu Park, Volume III, March 22, 2013, ("Sang-Kyu Park (SDI) Deposition") p.340.

[7] Exhibits 48 and 51, Netz Damages Report.

[8] Deposition of Jay Heinecke, July 31, 2012 ("Heinecke (TAEC) Deposition"), p. 64; Deposition of Jaein Lee, June 6-7, 2012, ("Lee (SDI) Deposition"), pp. 133-134, 179-180; Deposition of Michael Son, February 5-6, 2013 ("Son (SDI) Deposition"), p. 193.

[9] Contemporaneous documents acknowledge the differential impact of LCD competition on monitors and TVs. See, e.g., PHLP-CRT-049353 (a February 2004 presentation), which notes that "LCD technology development has exceeded all expectations" and that "CRT monitors are more severely affected by LCD demand." (p. 3)

declined during this time period, albeit more slowly: CRT TVs accounted for nearly 100% of global TV sales in early 2001 and 48% by the end of 2007.[10]

13. Given the differential impact of LCD and plasma competition on CPTs and CDTs, it would not be surprising to find very different price dynamics for them. Consistent with this view, my analyses of CRT pricing data demonstrate that global prices of CDTs fell more and earlier than prices of CPTs after 2000, as illustrated in Exhibit 2. The chart tracks average prices (measured using chained Fisher Indices[11, 12]) of CPTs and CDTs sold globally during the class period. As illustrated in Exhibit 2, the average prices of CDTs and CPTs fell during much of the period, but the average price of CDTs declined more than the average price of CPTs after 2000. This is consistent with the view that CDTs faced greater competition from LCDs than did CPTs. More generally, the fact that the relative prices of CPTs and CDTs sometimes deviated substantially for sustained periods of time during the class period (see Exhibit 2) is further evidence that CPTs and CDTs were affected by differentiated market forces.

---

[10] I exclude rear-projection CRT TVs from my analyses since I understand that they are not part of the instant litigation.

[11] The quarter-to-quarter change in the Fisher Price Index for CPTs (for example) represents an average of the percentage price changes for CPT models sold to the same customer in both quarters. The price changes across quarters 1 and 2 are averaged in two ways – once using the quarter 1 sales volumes as weights and once using the quarter 2 sales volumes as weights. The change in the Fisher Price Index represents the geometric mean of the two average price changes.

[12] Fisher Indices (or more precisely, chained Fisher Indices of the type I employ) are an accurate way to track changes in average prices of CRTs over time because they remove from price trends the effect of changes in product mixes. (Diewert, W. E. (1993). The Early History of Price Index Research & Fisher Ideal Output, Input and Productivity Indexes Revisited. In W.E. Diewert and A.O. Nakamura (Eds.), *Essays in Index Number Theory, Volume I*, Elsevier Science Publishers. pp. 58, 320-330; International Labour Organization. (2004). *Consumer Price Index Manual: Theory and Practice.* International Labour Organization. pp. 6-32.) This is important because the mix of CRTs changed substantially during the class period, with the advent of higher-quality flat, wide-screened, high resolution CRTs that were introduced in response to LCD and plasma competition. Since these high-quality CRTs were priced higher than lower quality CRTs, ignoring the improvement in product quality over time would mask declines in prices for CRTs of similar quality, and hence I remove the effects of changes in product mix by using Fisher Indices.

14. Dr. Netz's decision to analyze CPT and CDT pricing dynamics separately in her report indicates that she also recognizes that these two segments were affected by different market forces and by the same market forces differently. For example, Dr. Netz analyzes the relationship between actual prices and alleged target prices separately for CPTs and CDTs. In doing so, she allows for the possibility that the relationships between target prices as well as various market conditions and actual prices were different for CPTs and CDTs,[13] and indeed her CPT and CDT models produce different estimates of these relationships.[14] Similarly, Dr. Netz estimates overcharges for CPTs separately from CDTs, thereby allowing for the possibility that market factors and the putative cartel had very different impacts on prices for CPTs and CDTs,[15] and her CPT and CDT pricing models produce very different overcharge estimates for CPTs and CDTs.[16]

15. In sum, I conclude that it makes economic sense to analyze the impact of the alleged cartel on CPT prices separately from CDTs. In the next section, I examine the structural features of the CPT industry to see if they are consistent with characteristics identified by economic theory as conducive to effective cartelization.

IV. Characteristics of the CPT Marketplace Were Not Conducive to Sustained and Effective Collusion

16. Economic theory has established that cartels in industries with certain characteristics are less likely to be effective than cartels in industries without those features. Many of these features are found in the CPT industry during the relevant period.

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[13] Netz Damages Report, p. 65.

[14] Netz Damages Report, Exhibits 37-38 and 44-45.

[15] Netz Damages Report, pp. 104-105 ("Some case evidence suggests that prices of CDTs and CPTs did not respond to changes in market conditions in the same manner, therefore, I estimated separate CDT and CPT regressions.")

[16] Dr. Netz estimates that the overcharge during the 1995-2006 period was 22% for CDTs and 9% for CPTs. See Errata to the Expert Report of Janet S. Netz, Ph. D, July 3, 2014 ("Netz Damages Report Errata"), p. 1.

A. Availability of substitutes: Competition from LCD and plasma technologies

17. Economic theory indicates that the availability of attractive substitutes for a cartelized product constrains the ability of a putative cartel to achieve and sustain substantial increases in prices.[17] As noted above, from the early 2000s onward, fierce competition from LCD and plasma display technologies rapidly shrank the CPT share of the television market. Not only did competition from flat screen technologies reduce sales of CRT TVs, such competition constrained prices of CPTs and hence limited the ability of the putative CPT cartel to elevate CPT prices.

18. The influence of competition from flat screen technologies on CRT prices is evident in the fact that CRT prices fell fastest in the segments in which CRTs were displaced by flat screen technologies earlier and faster. For example, as explained above, competition from flat screen technologies eroded sales of CRT monitors earlier and faster than CRT TVs. Consistent with the greater competition that CDTs faced from flat screen technologies, Exhibit 2 shows that CDT prices declined faster than CPT prices once LCD products became more price competitive after 2000.

19. Similarly, differential impacts of flat screen competition on different *sizes* of CPTs provide evidence of the price constraining effects of flat screen competition. Specifically, LCD and plasma technologies displaced sales of large CRT TVs earlier and more significantly than sales of small and medium CRT TVs. As shown in Exhibit 3, the global penetration of CRT TVs larger than or equal to 25 inches shrank from 95% in 2001 to just 33% by late 2007,[18] while the penetration of CRT TVs below that size declined by less – from nearly 100% to about 79% during the same period. Consistent with the greater competition that large CPTs faced from flat screen technologies, Exhibit 4 shows

[17] Church, J, and Ware, R. (2000) *Industrial Organization: A Strategic Approach.* McGraw Hill. P.314.

[18] Contemporaneous documents classified TVs equal to or larger than 25 inches as "large." See e.g., PHLP-CRT-088309.ppt, p.4.

that prices of large CPTs[19] declined faster than prices of small and medium-sized CPTs once flat screen products became more price competitive after 2000.

20. In her expert report, Dr. Netz acknowledges that flat screen technologies rapidly displaced CPTs and CDTs during the class period.[20] Nonetheless, Dr. Netz contends that competition from LCD and plasma technologies could not have constrained the prices of CRTs and CRT finished products because flat screen products were priced substantially higher than CRT finished products.[21] This claim is incorrect as a matter of economic logic. It is also inconsistent with the record evidence and Dr. Netz's own analyses.

21. As a matter of economic logic and common sense, higher priced LCD TVs would have constrained lower priced CRT TVs (and by extension, prices of CPTs) if a material number of consumers considered CRT TV prices to be only marginally lower than LCD TV prices *after adjusting for differences in quality*. Inasmuch as at least some consumers viewed CRT TVs to be inferior to LCD TVs (for example due to the bulk and weight of the former[22]) to the point where they only marginally preferred CRT TVs at prevailing prices, then those consumers likely would be willing to switch to LCD TVs in the event of even a small increase in the relative price of CRT TVs. If there were a substantial number of such marginal consumers, then CRT TV prices and CPT prices would have been effectively constrained by LCD products.

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[19] Unless otherwise stated, for the purpose of my analyses, I define "large" CPTs to be CPTs that are at least 26 inches in actual diagonal length. TV size is measured in terms of the *viewable* diagonal length (see CFR-2011-title16-vol1-part410.pdf), whereas CPT size in the relevant CPT data is measured in terms of the *actual* diagonal length of CPTs. (The actual CPT size is 1 inch larger than viewable size for 25-inch viewable size. See e.g., MTPD-0122906.xls and 033 - 2011-06-01.pdf.)

[20] Netz Damages Report, p. 35, Exhibits 13 and 14.

[21] *Id.*, pp. 35-41.

[22] Contemporaneous documents refer to disadvantages of CRT TVs perceived by consumers. E.g., "As LCD prices fall CRTs will lose share;" "CRTs are boxy, heavy, thick and consume more power than competing technologies;" "Consumers [sic] belief that digital/HDTVs require non-CRT solution and that the CRT forma factory is old fashioned." (TAEC00006084. Shulklapper, Andrew. DisplaySearch HDTV Forum 2004: Accelerating the HDTV Transition, August 24-26, p. 11. See also pp. 4-17.)

22. Evidence that there were, in fact, a substantial number of marginal consumers during the class period, and hence evidence that prices of CRTs (including CPTs) were constrained by flat screen technologies, is found in the relatively greater declines in CRT prices in segments in which CRT sales lost ground to flat screen technologies relatively earlier and faster (as explained above).

23. Further evidence of the constraint imposed by flat screen technologies on CPT prices is found in Dr. Netz's own CPT overcharge econometric analysis. In that analysis, she employs an econometric model to explain the variation in the prices of CPTs. Dr. Netz estimates that increasing LCD penetration over time had a statistically significant impact on CPT prices. The impact was also economically significant as evidenced by the fact that she estimates that an increase in LCDs' market share from 0.3% to 60% was associated with a 30% decrease in the price of CPTs (all else being equal).[23] Clearly, CPT prices were materially constrained by LCDs according to Dr. Netz's own CPT overcharge model.

24. Further evidence of the impact of LCD competition on CPT prices as well as on non-price features of CPTs is found in contemporary documents. Such documents show that CPT manufacturers lowered prices in response to the competitive pressure exerted by LCD TVs.[24] They also show that CPT manufacturers responded to competition from flat screen technologies by improving CPTs. For example, manufacturers increased their offerings of flat screen CPTs. ("To compete with the flat panels, the CPT makers and TV

[23] Dr. Netz estimates the share of LCD shipments (LCD penetration) as the ratio of (a) LCD panel shipments and (b) the sum of LCD panel and CPT shipments in each quarter during the Q1 1993- Q1 2011 period. (Data from this period are used by Dr. Netz to estimate CPT overcharges.) The 25th percentile of this LCD share variable equals 0.3% and the 75th percentile equals 59%. Between 2000 and 2011, LCD's share increased from almost zero to more than 90%. Hence, the 0.3%-60% increase in the LCD share used as an example here is well within the range of LCD shares observed in the data.

[24] See, for example, Market Visitation Report, CHU00030071.01E-CHU00030078E at CHU00030078E, November 7, 2003 ("Traditional TV must continue to lower down prices. Under the pressure from LCD TV-→ prices for tube decrease [sic]").

OEMs are boosting production of flat-face CRTs."[25]) Clearly, CPT manufacturers altered their conduct in response to competition from flat screen technologies. The impact of such competition likely constrained the ability of the putative cartel to elevate prices during many years of the class period.

B. CPT heterogeneity, price complexity and opaqueness

25. CPTs were widely differentiated along many dimensions. CPT pricing depended on CPT size, shape (curved or flat), finish (whether a CRT is shipped with a deflection yoke ("ITC") or without it ("bare")), and the type of "mask"[26] included in the CPT. A particular CPT model was not easily interchangeable with other CPT models, even those that may have shared similar basic features. Each CPT model was designed to fit the specific technical requirements of a particular finished product requested by a customer. For example, the electrical components of the CPT and the connection points between the CPT and the external casing were specific to a given customer's finished product design.[27] Such customization limited the ability of a finished product manufacturer to interchange different CPT models for a given finished product.[28]

26. The heterogeneity in CPT prices is illustrated in Exhibit 5, which shows a substantial amount of CPT price dispersion in each quarter. Taking Q3 2001 as an illustrative

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[25] iSuppli, "Flat-Panel Sets Gain Strong Footing in TV Market", Television Systems, Market Tracker – Q1 2006, CHU00154658 – CHU00154694 at CHU00154673.

[26] The "shadow mask" is a finely perforated screen that ensures that an electron beam strikes the correct phosphor dot. "In a colour picture tube, it is absolutely necessary to ensure that each of the three electron beams strikes only one phosphor in each triad. For this purpose, a mask, called a shadow mask or an aperture mask, is inserted between the neck of the picture tube and the phosphor dot screen." (Bali, S. P. (1994). *Colour Television: Theory and Practice*. Delhi: Tata McGraw-Hill Publishing Company Limited. p. 83)

[27] Tobinaga (Panasonic Corporation, PNA, MTPD) Deposition, p. 142; Deposition of Toru Iwasawa, July 11, 2012 ("Iwasawa (Hitachi) Deposition"), pp. 29-30.

[28] For example, according to a Philips witness, customers could not always interchange a Philips CPT for another manufacturer's CPT without significant modifications to the finished product. (Deposition of Roger de Moor, July 31 - August 1, 2012 ("de Moor (PENAC) Deposition"), pp. 141-143.) An SDI witness testified that customers would take up to a year to qualify new suppliers of CPTs. Lee (SDI) Deposition, p. 213.

example, 10% of CPT sales volume were at prices below $27 and 10% were above $163 (i.e., more than 5x higher). Substantial price variation can be observed in Exhibit 5 for other quarters. This price variation was due to differences in product and customer characteristics, as well as associated differences in competitive pressures.[29]

27. Pricing complexity and diversity have been cited in testimony by executives from CPT manufacturers as reasons why manufacturers were unable to reliably assess the prices of other CPT manufacturers.[30] Economic theory shows that when prices are opaque, members of a cartel would have trouble monitoring fellow cartel members' conduct and detecting and punishing deviations from any agreements in a timely and effective way.[31] Opaque and complex pricing are all the more likely to have eroded the effectiveness of the alleged cartel because there were major changes in the industry during the class period such as the growing competitive presence of LCD and plasma technologies.[32] Under such conditions, it would be hard for cartel members to separate

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[29] Each observation in Exhibit 5 represents the average price at which a specific CPT model was sold to a specific customer in a specific quarter. Weighting observations by sales volume does not alter my conclusion that CPT prices in any given quarter exhibited substantial heterogeneity. For example, on average (across quarters in the class period), the 90th percentile of the sales-volume-weighted distribution of CPT prices in a given quarter was 88% higher than the weighted average CPT price for that quarter, and the 10th percentile of the distribution was 62% below the weighted average CPT price for that quarter. Put differently, on average, the 90th percentile of the sales-volume-weighted distribution of CPT prices in a given quarter was about 4.9 times as expensive as the 10th percentile.

[30] See, for example, Deposition of Yoshiaki Uchiyama (TACP), August 1, 2012 ("Uchiyama (TACP) Deposition"), pp. 51-52.

[31] See, e.g., Church, J., and Ware, R. (2000) *Industrial Organization: A Strategic Approach*. McGraw-Hill. p. 340.

[32] The shift from analog TV to digital TV in the U.S. was another notable change in the CRT marketplace during the class period. In particular, widescreen and high definition digital CPTs differed from analog CPTs and from CPTs used to display standard definition digital broadcasts. (United States International Trade Commission. (2000). *Color Picture Tubes from Canada, Japan, Korea, and Singapore, Investigations Nos. 731-TA-367-370 (Review), Determinations and Views of the Commission*. USITC Publication No 3291. pp. 21-22.) Other changes during the class period include substantial changes in the characteristics of CPTs, shifts in CPT production and consumption to lower-income countries, and the exit of firms such as Hitachi from the industry (see §VIII.A of this report). (It is my understanding that the Hitachi Defendants ceased

(footnote continued …)

price changes due to technology disruptions and other market changes unrelated to the alleged cartel from price changes due to cheating. Moreover, the sheer diversity of CPT prices due to the heterogeneity of products would have likely hindered the ability of CPT manufacturers to reach an effective agreement during any negotiations over CPT prices and outputs.

C. Asymmetries among CPT suppliers and vertical integration.

28. During the class period, several large CPT manufacturers were vertically integrated and manufactured finished CPT products (i.e., TVs) while others were not. Specifically, I understand that Hitachi was vertically integrated for some finished products during part of the class period, while Chunghwa, LPD, and SDI were not. I also understand that Panasonic Corporation and Toshiba Corporation were each vertically integrated for some finished products through at least March 2003 when they formed a new entity called MTPD, that acquired Panasonic Corporation's and Toshiba Corporation's former CRT manufacturing capacity,[33] with Panasonic Corporation retaining a controlling stake in MTPD.[34] Philips and LG were each vertically integrated through July 2001, at which

(… footnote continued)

manufacturing CDTs by December 2001 and CPTs by April 2002, and ceased selling CDTs by October 2002 and CPTs by March 2003.)

[33] Toshiba Corp.'s Himeji factory remained in operation for approximately a year after April 2003. During this year, the factory took orders from MTPD. (Deposition of Koji Kurosawa, July 30, 2012 ("Kurosawa (Toshiba Corp.) Deposition"), pp. 64-65.) I understand that for a short time following the April 2003 formation of MTPD, Panasonic Corporation continued to manufacture some CPTs for MTPD pursuant to a manufacturing services agreement. I further understand that these CPTs were sold to MTPD at cost plus 0.01%.

[34] Panasonic Corporation initially owned 64.5% of MTPD. (Kurosawa (Toshiba Corp.) Deposition, p. 154; PC-0020552.) In 2007, Panasonic Corporation acquired Toshiba Corporation's entire 35.5% ownership stake. (Deposition of Takashi Nakano, July 13, 2012 ("Nakano (Panasonic Corporation, PNA, MTPD) Deposition"), p. 33.) (In her analyses, Dr. Netz makes no distinction between sales data associated with MTPD and Panasonic Corporation.) I understand that another joint venture, Beijing Matsushita Color CRT Co., Ltd. ("BMCC") is a Chinese company 50 percent of which was held (directly and indirectly) by Matsushita Electric Industrial Co., Ltd. (later known as "Panasonic Corporation") and MEC at formation. I also understand that Panasonic Corporation's 50 percent interest in BMCC was sold to Chinese

(footnote continued …)

point they each divested their entire CRT manufacturing businesses to LPD – a newly formed independent joint venture. I further understand that alleged co-conspirator Thomson was also a vertically integrated manufacturer of televisions and CPTs.

29. Economists have identified such asymmetries in vertical integration as a contributor to cartel instability.[35] The price paid by a finished product manufacturer to an affiliated CPT manufacturer (the "transfer" price) is likely to be hard to detect by other firms, and the output incentives of a vertically integrated supplier of finished products are apt to differ significantly from those of non-integrated upstream and downstream producers.[36]

D. Fragmented market shares and low industry concentration

30. Effective coordination is less likely in industries that are relatively unconcentrated with diffused market shares of suppliers.[37] The CPT industry was unconcentrated during the relevant time period. For example, between 2000 and 2006, the Herfindahl-Hirschman Index (HHI) of global CPT production concentration varied between 1,200 and 1,400,[38] a range that the *Horizontal Merger Guidelines* of the U.S. Department of Justice and the Federal Trade Commission considers to be "unconcentrated."[39]

(… footnote continued)

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shareholders on December 24, 2009. I further understand that BMCC's sales data have been inadvertently included in Panasonic Corporation's data production in the instant matter.

[35] Carlton, D.W., and Perloff, J. M. (1999). *Modern Industrial Organization, 3rd edition.* Addison-Wesley. p. 138. To be clear, I do not mean to imply that successful cartelization is impossible in the presence of asymmetries in vertical integration, rather that economists have identified such asymmetries as a contributor to cartel instability.

[36] For example, whereas unaffiliated TV manufacturers could be expected to use favorable pricing offered by one CPT manufacturer to try to convince other CPT manufacturers to offer even lower prices, an integrated finished-product manufacturer would be much less likely to reveal that its upstream affiliate had cheated on the cartel agreement by lowering its transfer price.

[37] Cabral, L. (2000) *Introduction to Industrial Organization.* The MIT Press. pp.137-8

[38] HHI estimates from back-up data production related to Exhibit 6 of the Netz Damages Report.

[39] U.S. Department of Justice and the Federal Trade Commission. *Horizontal Merger Guidelines* (2010), at §5.3

31. Although the CPT industry is characterized by features that likely undermine any effectiveness of the alleged cartel, it is also true that the CPT industry is characterized by other factors that economists have identified as facilitating collusion (for example, high entry barriers due to substantial sunk costs of setting up CPT plants). Thus, whether or not the CPT cartel alleged by the IPP class was consistently effective in elevating the prices of all (or most) products to all or most customers during the nearly 13-year class period is ultimately an empirical question that needs to be resolved by examining the evidence on record. One element of such an analysis is an examination of the conduct of alleged cartel members and an assessment of whether their conduct is consistent with Plaintiffs' claims of effective collusion. I turn to this next.

V. Defendants' Conduct in the CPT Marketplace Was Inconsistent with a Sustained and Effective Cartel that Had a Class-wide Impact.

A. A large majority of CPT sales were not subject to the target prices allegedly set by Defendants.

32. Dr. Netz contends that the alleged conspirators successfully elevated the prices for all or most CPTs sold during the nearly 13-year proposed class period in part by agreeing to a set of "target prices."[40] However, the CPT "target prices" allegedly set by Defendants applied to only a small minority of global CPT sales, and the extent of target price coverage was far from uniform across products and regions.

33. Specifically, Dr. Netz alleges that the target prices she identified correspond to 29.7% of the worldwide CPT sales during the class period.[41] Thus, even by her own calculations, Dr. Netz did not identify target prices for the great majority of global CPT sales. However, this estimate exaggerates the actual coverage of claimed target prices because Dr. Netz employs a flawed methodology to match CPT sales with the claimed CPT target prices. Specifically, Dr. Netz's CPT target price coverage estimate includes many instances in which the allegedly matching target price is for a different

[40] Netz Damages Report, p. 48.

[41] Netz Damages Report, p. 63.

manufacturer, a different month, and/or a different set of product characteristics than the purportedly matched sale.[42] It is not possible to identify all of these instances using the available data. However, excluding just those instances that can be identified reveals that at most 17.4% of CPTs sold worldwide during the class period was actually associated with an alleged target price.[43, 44] (See Exhibit 6.)

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[42] Dr. Netz greatly overstates the coverage of target prices that she identifies for three reasons. First, with some exceptions, Dr. Netz assumes that a target price applied to each Defendant regardless of whether the Defendant was present at the meeting at which the target price was allegedly decided (or whether any other indication is given in the meeting minutes that the Defendant had agreed to that price). For example, Dr. Netz identifies a number of alleged target prices based on the minutes of an August 1999 meeting attended by IRICO, Orion, and Chunghwa. (CHU00030827E) She then assumes that these target prices applied to all of the Defendants even though only IRICO, Orion, and Chunghwa were in attendance according to the document relied on by Dr. Netz (and there is no indication in the meeting minutes that any other Defendant had agreed to those prices). Dr. Netz then proceeds to match the target prices to sales by Defendants that were not at the meeting, such as Toshiba Corp., Panasonic Corporation, and SDI, and treats those sales as "covered" by the target prices she identified. As a result, Dr. Netz's coverage estimate includes a substantial number of sales that Dr. Netz just assumes were covered by the identified target prices even though she provides no evidence that the manufacturers that made those sales ever had any discussions about – much less agreed to – the alleged target prices. Second, Dr. Netz's calculation represents the share of all unit CPT sales in Defendants' data that match a CPT target price on manufacturer, size, finish, and quarter. (Netz Damages Report, fn. 203.) As a result, if Dr. Netz identifies an alleged target price for a CPT with a particular manufacturer, size, finish, and quarter, she assumes that it "covers" all sales of CPTs of that application and size sold during that specified quarter. The alleged target price may refer explicitly or implicitly to a particular shape, resolution, frequency, safety standards, mask type, neck diameter, and/or shipping terms, but for the purposes of calculating the share of CPT sales "covered" by the alleged target prices, Dr. Netz does not consider whether the models sold shared any of those attributes with the alleged target prices. Lastly, Dr. Netz identifies the months in which she believes each target price was effective, but for the purposes of calculating the share of CPT sales "covered" by the alleged target prices, Dr. Netz includes all the CPT sales for a given manufacturer, size, and finish for all three months in a given quarter if she identified a CPT target price for that manufacturer, size, and finish that was allegedly effective in even just one of those three months.

[43] The methodology used to correct Dr. Netz's coverage estimates is described in the notes to Exhibit 6 of my report.

[44] Additionally, as I discuss further below, target prices were much less common for larger, more expensive CPTs. As a result, whereas the share of CPT units sold worldwide during the class period that were associated with an alleged target price was at most 17.4%, the share of

(footnote continued …)

34. As discussed in the previous section, large CPTs faced a significantly greater competitive constraint from LCD and plasma technologies than did small CPTs. This can be expected to have made it even more difficult to have sustained an effective conspiracy to elevate the prices for large CPTs. Consistent with this finding, the target price coverage was substantially lower for large CPTs than small CPTs. Specifically, while a maximum of 22.2% of small and medium CPTs sold worldwide during the class period were associated with an alleged target price, at most only 5.0 % of large CPTs were associated with an alleged target price.[45] (See Exhibit 6.) This is not consistent with an effective elevation of the prices of large CPTs.

B. Data on CPT sales prices are consistent with pervasive cheating on the alleged target prices. The extent of such cheating varied across products.

Sales Prices Were Typically below Target Prices

35. Although only a small minority of CPT sales was subject to the target prices identified by Dr. Netz, if the putative cartel members had strongly adhered to those target prices, one would expect rarely to observe CPT sales prices being set below the claimed associated target prices. However, the data on record show that Defendants frequently priced below target prices. Specifically, 60.4% of the CPTs sold worldwide for which Dr. Netz identified an alleged applicable target price were priced below that target price.

36. Even this figure under-estimates the extent to which Defendants priced below target prices inasmuch as target prices were often set only with respect to relatively basic

(… footnote continued)

worldwide CPT sales *revenues* during the class period that were associated with an alleged target price was at most 10.1%.

[45] These coverage estimates are based on the corrections to Dr. Netz's flawed methodology for estimating target price coverage, which were described earlier in *supra* note 42 and in notes to Exhibit 6 of my report. Although the estimated coverage is higher without these corrections, the gap in coverage between large and small CPTs persists (13.7% for large CPTs compared to 35.8% of small CPTs).

models within the group, as Dr. Netz has acknowledged.[46] Thus my estimates of CPT prices below target prices compare a *target* price often set for more basic models in a group with an average *actual* price that includes both basic and premium CPTs in that group. Because prices for premium CPTs are likely to be higher than for basic models, this is not an apples-to-apples comparison. Instead, it biases average actual prices up relative to the alleged target price and thus biases my estimate of the share of CPTs sold at prices below the alleged applicable target prices. Put differently, if it were possible to identify the actual prices only for the specific CPT models for which the target prices were set (i.e., often the more basic models), one would almost surely find that the share of CPTs sold at prices below the alleged applicable target price was greater than 60.4%.

37. So far, my comparison of actual and target prices has pooled all categories of CPTs together. Next, I segment the analysis by CPT size in order to demonstrate the lack of uniformity across various sizes in the extent to which actual prices deviated from target prices. As explained above, the share of CPT sales associated with an alleged target price was significantly lower for large CPTs than for small CPTs, which is consistent with the relatively greater competitive constraint imposed on large CPTs by LCD and plasma technology. Consistent with this, I find that the share of actual prices below the alleged applicable target price was higher for large CPTs (72.9%) than for small and mid-sized CPTs (58.5%). Thus, only 5.0% of worldwide large CPT sales were covered by Dr. Netz's target prices and even for those covered, 72.9% of sales were below the target prices during the class period. Put differently, only 1.4% of large CPTs sold worldwide during the class period were covered by the alleged target prices identified by Dr. Netz and had prices equal to or above those target prices.

Changes in Sales Prices Typically Did Not Adhere to Changes in Target Prices

38. If the alleged cartel members closely adhered to the putative target prices, then changes in target prices would reliably predict changes in actual prices. In fact, the

[46] Declaration of Janet S. Netz, Ph.D., in Support of Motion of Indirect-Purchaser Plaintiffs for Class Certification (hereafter "Netz Initial Class Report"), p. 63.

relevant data demonstrate that quarterly changes in target prices are extremely poor predictors of changes in actual prices.

39. For example, based on several documents from late 2002 and early 2003, Dr. Netz contends that alleged cartel members agreed to elevate the target prices of 20-inch Bare CPTs by 6.34% from Q4 2002 to Q2 2003.[47] If the alleged cartel members adhered to the alleged target prices when setting their actual sales prices, then their actual 20-inch Bare CPT sales prices would have increased by an amount approximately similar to the alleged increase in the target price during the relevant period. Conversely, if alleged cartel members rarely adhered to the alleged target prices, then we should observe that changes in actual sales prices of 20–inch CPT models were inconsistent with changes in the target prices identified by Dr. Netz.

40. The broad lack of conformity between changes in the target prices identified by Dr. Netz and changes in actual CPT prices is illustrated in Exhibit 7. In this chart, the vertical axis represents quarterly changes in actual sales prices of CPT models and the horizontal axis represents changes in the corresponding alleged target prices during the same time period.[48]

41. If actual prices followed target prices closely, I would expect most observations in Exhibit 7 to be located close to the 45-degree line (which is traced in the chart) indicating that an actual price change was equal to the alleged applicable target price change.

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[47] This example is based on a review of Dr. Netz's target price database ("clean_target.dta" produced as part Dr. Netz's Damages Report back-up).

[48] Dr. Netz identifies CRT target prices based on her reading of the case record. She partitions these target prices by manufacturer, application (CDT or CPT), size, and finish (bare or ITC) ("group") and quarter. She then derives an average target price for each group and quarter for which she has identified any target prices. In Exhibit 7, for each CPT model produced in a given factory and sold to a given customer, I compared changes in the actual quarterly prices for that model, factory, and customer to changes in the alleged average target price for the corresponding group. For example, I compared the change in the actual quarterly price paid for a particular Chunghwa 14-inch ITC CPT model (6836403256) between the third quarter and fourth quarter of 2002 with the change in the average alleged target price for all Chunghwa 14-inch ITC CPT models during the same time period.

However, although most of the data points are located in the lower left quadrant of the chart – consistent with the general downward trend in CPT prices over the course of the class period – the points are widely diffused rather than clustered around the 45-degree line, which demonstrates that changes in actual prices for CPTs differed widely from changes in the alleged applicable target prices. Moreover, the bottom right quadrant of Exhibit 7 shows many instances where the target prices increased whereas the actual sales prices decreased.

42. An econometric analysis of changes in actual and target CPT prices further confirms the frequent deviations of the actual prices from the target prices identified by Dr. Netz.[49]

[49] In this econometric analysis, the dependent variable is the quarterly change in the price paid by a customer for a given CPT model and the independent variable is the contemporaneous change in the associated target price identified by Dr. Netz. I compare actual and claimed target price *changes* because such a comparison is a direct test of putative cartel members' adherence to target prices. To be effective in an environment where prices are declining, a cartel would have to guard against overly aggressive price decreases by cartel members who could use such price cuts to gain sales at the expense of other cartel members. The logic of Dr. Netz's cartel theory implies that the alleged CPT cartel used newly announced target prices as a mechanism to set limits to price decreases. As such, if the alleged cartel were, in fact, effective and its members adhered to target prices, then they would have changed their sales prices in compliance with changes in announced target prices.

Moreover, analyzing the relationship between *changes* in target and actual sales prices is preferable to analyzing the relationship between *levels* of such prices because target price levels are likely to be somewhat predictive of actual price levels even if the alleged cartel members completely ignored the alleged target prices. Put differently, levels of target and actual prices would be correlated even if setting target prices had no impact on actual CPT price levels. This is because most consumers would be willing to pay more for a larger TV, all else equal, so one would expect actual prices to be higher for 29-inch CPTs than for 21-inch CPTs even in the absence of the alleged cartel. Likewise, given consumers' willingness to pay more for larger TVs, an aspiring cartel could be expected to set higher target prices for 29-inch CPTs than for 21-inch CPTs. More generally, one would expect both actual prices and target prices to be higher for higher quality CPTs – which would lead to a high degree of correlation between actual and target price *levels* – regardless of whether the alleged cartel members ever adhered to the target prices. Because an econometric analysis of actual and target price levels measures the extent of correlation between these two prices, and because one would expect their correlation to be high regardless of whether the alleged cartel members ever adhered to the target prices, such an analysis is unlikely to be able to distinguish between adherence and non-adherence to target prices. In principle, it may be possible to control for differences between, say 29-inch CPTs and

(footnote continued …)

The analysis shows that changes in Dr. Netz's target prices explain only 3.9% of the variation in changes in the actual prices for corresponding CPTs. (See Exhibit 8, row 1.) If actual sales price changes adhered closely to target price changes, this percentage would instead be very high.

43. Moreover, target price changes do an extremely poor job of predicting changes in actual prices, even on average. Specifically, a 5% increase in the target price identified by Dr. Netz is, on average, associated with only a 1.06% increase in the actual price during the same quarter.[50] (See Exhibit 8, row 1.) Furthermore, even this slight correlation does

(… footnote continued)

21-inch CPTs (or CPTs with a different finish, shape, mask, etc.), but this becomes much more difficult when the relative demand for various product attributes changes significantly over time. For example, as discussed in Section V.D below, estimating Dr. Netz's hedonic regression analysis on an annualized basis shows that the average premium for 29-inch CPTs compared to 21-inch CPTs was 144% in 2000 but only 106% in 2005.

Finally, any analysis of the relationship between the levels of sales prices and target prices is problematic because both types of prices were strongly trending downward during the relevant period due to the impact of declining manufacturing costs and/or declining demand. Even if sales prices were always set below target prices at competitive levels (i.e., putative cartel members never complied with target prices), the two sets of prices would appear to be highly correlated because both were impacted by the same market forces. Here again, in principle, it may be possible to control for changes in market conditions that affect both actual and target prices, but this is a much more daunting task when market conditions changed as dramatically as in the CPT industry during the nearly 13-year class period. To wit, as discussed in Section XIII below, Dr. Netz attempts to control for changes in market conditions in her overcharge analysis, but because the changes in the CPT industry during the class period were so fundamental, the relationships between CPT prices and the various economic indicators included in her model were not stable, and thus her model fails to properly control for changes in market conditions.

[50] In my analysis, adherence to target prices is measured using U.S. dollars. While the CRT prices were negotiated in different currencies, the degree of adherence to the purported target prices is most logically measured using U.S. dollars. This conclusion follows naturally from Dr. Netz's allegation that the alleged cartel was (in part) orchestrated through the use of target prices that were denominated in U.S. dollars. In fact, she assumes that there was only a single global target price (expressed in U.S. dollars) for any given product (or set of products) at a particular point in time – not different target prices depending on the region of sale or the currency in which a particular price was negotiated. If the alleged cartel members closely or uniformly adhered to the alleged U.S. dollar-denominated ("USD") target prices, then changes in USD target prices should reliably predict changes in USD actual prices. Nevertheless, for further assessment of my results, I added independent variables that control for changes in the exchange

(footnote continued …)

not imply causation (i.e., the change in actual price may not be due to the change in target price) since actual and target price changes are both likely to have been affected in the same direction by common market factors, generating some positive correlation between the two series, irrespective of whether the alleged cartel members ever adhered to the alleged target prices. In fact, if I control for changes in the market variables (such as the unemployment rate in OECD countries) that Dr. Netz included in her analysis of actual and target prices, a 5% increase in the target price identified by Dr. Netz is, on average, associated with only a 0.57% increase in the actual price (i.e., roughly half as much as when no market variables are included). (See Exhibit 8, row 2.)

44. As discussed above, Dr. Netz identified alleged target prices corresponding to a substantially lower share of sales of large CPTs than sales of small CPTs. Furthermore, prices of large CPTs were more likely to have been below the corresponding alleged target prices than prices of small CPTs. Both these facts are consistent with the evidence that LCD and plasma technologies exhibited a stronger and earlier competitive constraint on the pricing of large CPTs than small CPTs.

45. Consistent with these findings, when I perform econometric analyses of actual and target price changes separately for large and small CPTs, I find that changes in target

(… footnote continued)

rate between the currency in which prices were negotiated ("negotiated-price currency") and U.S. dollars to my econometric analysis of changes in USD actual prices and USD target prices. These variables allow the model to account for any impact that changes in the exchange rate between the negotiated-price currency and U.S. dollars had on USD actual price changes. My qualitative results remain unchanged. Specifically, the R-squared statistic associated with this econometric model is 0.134 (See Exhibit 8, row 3.), indicating that changes in the target prices identified by Dr. Netz and changes in the exchange rates between the negotiated-price currency and U.S. dollars together explain only 13.4% of the variation in changes in CPT actual USD prices. Additionally, the estimated coefficient on the target price change in this model is 0.184, which is lower than in the model without controls for exchange rate movements, and implies that a 5 percentage point increase in the target price identified by Dr. Netz is, on average, associated with only a 0.92 percentage point increase in the actual price during the same time period. Thus, even after controlling for the influence of exchange rate movements on USD actual price changes, the results of my econometric model demonstrate that the alleged cartel was far from uniformly effective (if at all).

prices explain an even smaller share of the variation in changes in the actual prices of large CPTs (0.2%) than small CPTs (4.8%). (See Exhibit 8, rows 4 and 5.) Moreover, whereas a 5% increase in the target price for a small CPT is, on average, associated with a minor (1.1%) but statistically significant increase in the actual price of corresponding CPTs, a 5% increase in the target price for a large CPT is, on average, associated with a *decrease* in the actual price of corresponding CPTs that is not statistically significant (i.e., one cannot reject the possibility that there is zero association between the target and actual prices within standard levels of statistical confidence). These results further reinforce my finding that even if the alleged cartel were effective at elevating the prices of some CPTs at some points in time, the effect was likely much smaller – possibly zero – for large CPTs than for small CPTs.

46. As an extension of my analysis of actual and target price changes, I have also employed an econometric model to test how well changes in CPT target prices predict contemporaneous changes in the actual prices of CPTs for which Dr. Netz did *not* identify target prices. I find that quarter-to-quarter changes in the target price index created by Dr. Netz have little ability to predict changes in the prices of CPTs for which Dr. Netz was unable to identify target prices. Specifically, quarter-to-quarter changes in her target price index explain only 2.3% of the variation in changes in the actual prices for non-targeted CPTs over the same pair of quarters. My analysis also indicates that a 5% increase in the target price index created by Dr. Netz is, on average, associated with only a 1.25% increase in the actual prices of non-targeted CPTs during the same quarter.

47. The inability of changes in target prices to predict changes in non-targeted actual prices is further illustrated in Exhibit 9. This chart is analogous to Exhibit 7, except that now the vertical axis represents quarterly changes in actual sales prices of *non-targeted* CPTs, and the horizontal axis represents contemporaneous changes in the target price index created by Dr. Netz. The fact that the points in Exhibit 9 are widely diffused rather than clustered around the 45-degree line demonstrates that changes in actual prices for CPTs differed widely from changes in the target price index.

48. In sum, the evidence indicates that the target prices set by the alleged cartel were either ineffective or at least were not frequently effective in elevating sales prices of

CPTs. Thus, the data are inconsistent with Dr. Netz's claim that the alleged target prices constituted a mechanism by which the alleged cartel effectively elevated CPT prices class-wide.

C. Dr. Netz's analysis of actual and target prices at most demonstrates a positive relationship between actual and target prices. It does not demonstrate that the alleged target prices had an impact on actual CPT prices.

49. Dr. Netz reviews the same data that I discussed in the previous section but reaches a different conclusion. In particular, she presents a regression analysis that she purports shows that target prices "exhibit a strong, positive, and economically meaningful predictive effect on the actual prices charged by Defendants."[51] However, Dr. Netz's conclusion is misguided for several reasons.

50. First, Dr. Netz's analysis of actual and target prices at most demonstrates a positive relationship between them. It does not demonstrate that the alleged target prices had an impact on actual CPT prices for the following reasons:

- Both actual sales prices and target prices likely responded to changes in the same market conditions. The control variables that Dr. Netz included in her regression[52] do not capture all of the market forces that affected both actual and target prices. Consequently, one would expect to observe a positive relationship between actual and target prices regardless of the extent to which target prices influenced actual prices.
- There is evidence in the documents cited by Dr. Netz of the alleged target prices being set at least partly based on past actual prices.[53] If target prices were set even partly based on actual prices, then one would expect to find a positive relationship, at least on average, between actual prices and

[51] Netz Damages Report, p. 65.

[52] I demonstrate later in this report (in § IX) that market variables other than the ones used by Dr. Netz affect CPT prices.

[53] See, e.g., Visitation Report, July 18, 1997, CHU00028707; Customer Contact Report, November 21, 1997, CHU00028674.

target prices even if target prices did not have any causal impact on actual prices.

- Finally, even if actual prices and target prices exhibit a positive relationship, it does not preclude the possibility that actual prices were frequently below the alleged applicable target prices. In fact, as discussed above, a majority of actual CPT prices were below the alleged target prices.

51. Second, I have assessed whether the alleged target prices, expressed in the same functional form as in Dr. Netz's analysis, are reliable predictors of actual price levels.[54] If the alleged cartel members had adhered consistently to the alleged target prices, the target prices would be able to predict actual prices with great precision. In fact, a statistical analysis of actual and target prices reveals that predicting the average actual price for a given CPT based on the alleged applicable target price could be expected to be wrong by more than 5% at least 86% of the time, by more than 10% at least 72% of the time, and by more than 15% at least 56% of the time.[55,56] (See Exhibit 10.) Given that documents cited by Dr. Netz indicate that price differences of even 5% can result in shifts in sales

[54] Specifically, similar to Dr. Netz, in the first stage of my analysis I regress the natural log of the quarterly average price for a given panel (defined by Dr. Netz to include all CRT sales that share the same manufacturer, application, size, finish, factory and customer) and quarter on the natural log of the matched target price. Unlike Dr. Netz's regression, I do not include the natural log of the average actual price from the previous quarter, any macroeconomic variables, or product fixed effects because if the alleged cartel members adhered uniformly to the alleged target prices, then target prices alone should be able to accurately predict actual prices.

[55] These results are statistically significant at the 95% confidence level. Specifically, they are based on the 5% lower bound on the variance of the prediction errors.

[56] The regression does produce a relatively high R-squared statistic. However, as discussed earlier, actual price levels and target price levels are both likely to be heavily influenced by product characteristics and the same market conditions. As a result, a regression of actual price levels on target price levels could produce a high R-squared statistic even if the alleged cartel members did not adhere at all to the alleged target prices. Nevertheless, my analysis shows that predictions of actual prices based on target prices would frequently be wrong by economically meaningful amounts.

and shares,[57] the fact that predictions of actual prices based on observed target prices would frequently be wrong by more than 5%, 10%, and even 15% confirms my earlier finding that target prices are poor predictors of actual prices. This finding is consistent with substantial non-adherence of alleged cartel members to putative target prices, and to an alleged mechanism of collusion that relies on them.

52. Dr. Netz also presents a regression analysis that she purports shows that target prices "exhibit a strong, positive, and economically meaningful predictive effect on the actual prices [of non-targeted CPTs] charged by Defendants."[58] This analysis suffers from all of the aforementioned flaws exhibited by her analysis of the relationship between target prices and actual prices of allegedly targeted CPTs. Extending my own statistical analysis to the actual prices of non-targeted CPTs reveals that predicting the average actual price for a given non-targeted CPT based on the target price index created by Dr. Netz could be expected to be wrong by more than 5% at least 95% of the time, by more than 10% at least 91% of the time, and by more than 15% at least 86% of the time. (See Exhibit 11.) The fact that predictions of actual prices of non-targeted CPTs based on observed target prices would frequently be wrong by more than 5%, 10%, and even 15% confirms my earlier finding that target prices are poor predictors of actual prices for non-targeted CPTs, and it is inconsistent with Dr. Netz's claim that the alleged cartel adhered closely to target prices.

D. Dr. Netz's hedonic regression analysis fails to establish that prices of CPTs that were not subject to the target prices she identifies were also elevated because of a "price structure" that links the prices of targeted and non-targeted CPTs.

53. Dr. Netz's conclusion of common impact rests heavily on her claim that CPT prices exhibited a "structure" such that "prices of different types are related to each other via product characteristics, and therefore setting a target price increase for one type of CPT

[57] See, e.g., CPT Sales Division Customer Contact Report, October 4, 1999, CHU00028599; CDT Market Report, May 28, 2004, CHU00031249; and Customer Contact Report, February 2, 1997, CHU00028763.01E.

[58] Netz Damages Report, p. 72.

implies a price increase for other CPTs."[59] To support this claim, Dr. Netz presents what she refers to as a "hedonic pricing analysis."[60] However, Dr. Netz's claim of a price structure is refuted by her own data and analyses.

54. First, Dr. Netz's own overcharge analysis refutes her claimed existence of a CPT price structure. As I explain below, Dr. Netz's own CPT overcharge regression analysis finds no statistically significant overcharge for large CPTs (i.e., one cannot reject the possibility of zero damages for large CPTs within standard levels of statistical confidence), whereas it estimates a positive and statistically significant overcharge for small CPTs. Thus, accepting Dr. Netz's CPT overcharge analysis necessarily requires rejecting her claim of a price structure since, under her interpretation, her overcharge analysis implies that the alleged cartel elevated prices for small CPTs, while also implying that it did not elevate prices of larger CPTs.

55. Second, if a price structure of the sort alleged by Dr. Netz actually existed (and if the alleged cartel members closely adhered to the putative target prices identified by Dr. Netz), then changes in target prices should reliably predict changes in actual prices of CPTs that were *not targeted*. In fact, as discussed above, the relevant data demonstrate that quarterly changes in target prices are extremely poor predictors of changes in actual prices of CPTs that were not targeted.

56. Third, Dr. Netz's own hedonic regressions provide evidence that there was no price structure due to divergent market conditions among various segments of CPTs. This is evident in the considerable variation over time in the relative price premiums commanded by larger CPTs over smaller CPTs, which is strong evidence that market conditions differed materially between large and small CPTs. For example, annualized versions of Dr. Netz's sales price hedonic regressions show that, in 2000, 29-inch CPTs were priced 144% above 21-inch CPTs on average. By 2005, this premium decreased to 106%. Clearly, the relative prices of CPTs of different sizes varied substantially even during

[59] Netz Damages Report, p. 69.

[60] Netz Damages Report, pp. 68-69.

short time periods, consistent with the greater impact of plasma and LCD competition on larger CPTs and inconsistent with Dr. Netz's claim of a price structure.[61]

E. The documentary record of communications between Defendants cited by Dr. Netz does not establish that the alleged cartel was successful in substantially and consistently elevating CPT prices class-wide.

57. In her report, Dr. Netz cites to the record of communications between Defendants as evidence that the alleged cartel was effective in raising CPT prices.[62] As a general matter, communications between competitors that disseminate information about prices, costs and investments can enhance efficiency.[63] The actual competitive impact of communications between competitors in a specific marketplace needs to be evaluated empirically based on available evidence for that marketplace. For example, as explained above, target prices identified by Dr. Netz based on communications between Defendants applied to only a minority of CPT sales during the class period. Furthermore, actual CPT prices were typically below associated target prices, and changes in actual CPT prices typically diverged from changes in associated target prices. These facts are inconsistent with Dr. Netz's claim that communications related to target price setting had a sustained and material impact on CPT prices.

58. Nonetheless, Dr. Netz contends that if cartel members were behaving rationally, they would not have engaged in the alleged conduct for such an extended time period if the

[61] A "price structure" of the sort claimed by Dr. Netz cannot exist if prices in different segments of CPTs were affected by materially different market forces such that the ability and incentive of the alleged cartel to affect CPT prices differed across CPT segments. For example, if the alleged cartel substantially elevated the prices of some CPTs but failed to elevate prices of other CPTs (or elevated them less) because the latter had better substitutes and faced greater competition from alternative technologies, then relative prices in the actual and but-for worlds would be quite different – precisely the opposite of what Dr. Netz's price structure would require.

[62] Netz Damages Report, § VIII.A.3.

[63] For example, information about competitor pricing reduces the dispersion of prices, and sharing information about current market conditions may enable firms to plan more effectively and manufacture more efficiently. (Rosenfield, A., Carlton, D., and Gertner, R. (1997) "Communication Among Competitors: Game Theory and Antitrust." *George Mason Law Review.* Vol. 5, No. 3, pp. 423-440.)

cartel were ineffective.[64] Although Dr. Netz is correct that it would be irrational to engage in the alleged conduct if the perceived benefit were not at least as large as the costs, given the substantial volume of CPT sales that Dr. Netz estimates was sold worldwide during the class period (about $136 billion), even sporadic, temporary, small increases in some CPT prices above but-for levels could have generated sufficient increases in revenues and profits to have offset the costs perceived to have been associated with the putative cartel. Thus, even if the alleged cartel members engaged in the alleged conduct for an extended period of time, it does not necessarily follow that the claimed cartel was able to effect a large sustained percentage increase in the prices of CPTs above their but-for levels. In fact, a cartel that was able to only temporarily elevate the prices of certain CPTs used in certain TVs in certain regions may nonetheless have found it rational to continue to engage in the alleged conduct for a lengthy period. However, such a cartel would not have had a class-wide impact. As such, the argument by Dr. Netz in this context is irrelevant for her claim that the putative cartel harmed all or nearly all members of the IPP class.

59. Dr. Netz further contends that the documentary record shows that the Defendants "reported their success in raising or maintaining their prices."[65] However, other documents indicate significant competition among CRT manufacturers. For example, an investigation into the causes of LPD's bankruptcy notes that "[t]he CRT industry was characterized by a predominant focus on cost reduction, fierce competition, decreasing sales and constant consolidation [in the years following the formation of LPD in 2001]."[66] Moreover, even documents cited by Dr. Netz as evidence of cartel conduct often show meeting participants found the CPT marketplace to be competitive and/or that

[64] Netz Damages Report, pp. 31-32.

[65] Netz Damages Report, p. 27.

[66] 2009-04-20 - Investigation of the Causes of the Bankruptcy of LG Philips Displays, p. 93.

Defendants often engaged in pricing conduct that deviated from what Dr. Netz characterizes as agreements between them.[67]

[67] CPT-related examples include the following:

- *CPT Makers Competitive Analysis*, LPD-NL00140679-692, at 686, September 2005 ("Extremely competitive environment due to huge overcapacity in the market – some players survive based on captive customers or protected market.")
- *2006 Sales Budget Proposal*, PHLP-CRT-009472 at p.3 ("New competition in midst of oversupply"; "SuS promotion to fend off Chinese attack"; "Price pressure from China")
- *Visitation Report*, CHU00029179.01E – 179.02E at 179.02E, August 23, 1999 ("Low price still offering [sic] ([by] IRICO, Samtel, Philips Brazil, Ekranas, etc.) The attendees agreed with SDD Mr. Inn Kim's proposal to approach the above-mentioned CRT manufacturers who have been destroying the market price with low-price competition and provide these manufacturers with timely updates on the market situation on demand and price information in order to convince them to follow suit.")
- *14"/20"/21" CPT supply and demand situation and price comments and reviews*, Chih-Chun Liu Deposition Exhibit 1142E, CHU000029235.01E- 237E at 235.01E (translated), April 1999 ("After consolidating the market situation reports from the meeting attendees of various makers, the update is as follows: The price in Q2 keeps sliding to some extent because some makers still approach new customers to get orders (eg. Orion→SREC, LG→TCE [sic]).")
- *CPT Visitation Report,* CHU00029971.01E – 972E at 971.01E, June 2005 ("The focus of concerns of the meeting attendees are still on the China market, the crazy low prices used to secure orders caused by high inventories in China worries them. Moreover, they are threatened by the fact that low priced products from Huafei, Evernew and Hitachi are already being sold in Southeast Asian markets… We and T-CRT complained that the Japan and Korean makers all have factories in China and are all pursuing high utilization production and sales. This has not only resulted in constantly falling prices in Mainland China, it has also caused second tier color tube factories to dump low prices in Southeast Asia. If the Japan and Korean makers do not follow effective plans devised by HQ, but rather choose to sit and watch low pricing competition between China factories, the Southeast market will be quickly undermined. But the mumble jumble of the Japan and Korea makers in attendance offer little room for optimism.")
- *Marketing Contact Report (Glass Meeting)*, CHU00029999.01E – CHU00030000.02E at 29999.02E, November 2004 ("Remark: It's difficult to determine the true and false [sic] of the prices quoted above by MTPD but the intention to cut price [sic] among the competing brands is clearly expressed. Price war has already begun…The China market situation will have a massive impact on Q1 in 2005... Overcapacity for CRT will begin to compete for export orders and thus generate more intense competition.")

(footnote continued …)

60. Dr. Netz also cites to documents suggesting that the Defendants engaged in conduct aimed at reducing CPT output and capacity.[68] However, Dr. Netz's own estimates of CPT global capacity show that prior to the emerging success of LCD and plasma technologies, the Defendants rapidly expanded CPT capacity and production (as I explain below). As a result, even if the Defendants did engage in attempts to restrict CPT output, the impact (if any) of such efforts likely was not significant, consistent, or sustained. In any event, Dr. Netz presents no empirical analysis that would aid the fact-finder in determining how effective those alleged efforts were.

61. In sum, the documentary evidence related to Defendants' communications cited by Dr. Netz is insufficient to determine if the alleged cartel was successful in consistently and significantly elevating CPT prices. Instead, evidence of Defendants' conduct related to actual CPT prices, margins and capacity is more relevant for assessing the magnitude and consistency of the impact of the alleged cartel on CPT prices. I have already compared actual CPT prices with target prices identified by Dr. Netz and demonstrated that their relative levels and divergent movements are inconsistent with a claim of a highly effective cartel. In the next section, I provide additional evidence related to CPT prices, margins and capacity.

(… footnote continued)

- *Market Visitation Report (Glass Meeting)*, CHU00030036.01E – CHU00030039E at 037.01E, February 2004 ("*MTPD* has admitted that it already quoted *USD31.50,* imposing tremendous pressure on other makers including CPT to lower their prices for *Funai*.")
- *CPT Visitation Report,* CHU00036408.01E – 409.02E at 409.01E, November 2001 ("Because certain tube maker [sic] in mainland China are grabbing orders with low prices, Thai-CRT seeks to compete by following suit, causing the market price to tumble …This approach has already severely damaged the CPT industry." "Most prices are actually lower than the Guideline price [sic]. It seems that the various makers are unable to provide their actual prices.")

[68] Netz Damages Report, pp. 50-1.

VI. Evidence on CPT Prices, Margins, Capacity and Production Do Not Support the Claim of a Highly Successful Cartel.

62. A cartel that was consistently and broadly effective would have altered the conduct and performance of its members in ways that would be readily apparent in prices, profit margins and investment activity. As I explain in this section, straightforward evidence on these variables is inconsistent with the sort of highly effective cartel claimed by Dr. Netz.

A. No evidence that CPT prices decreased slower during the putative cartel period.

63. Dr. Netz claims that "the defendants … colluded to hold prices steady or reduce prices only slowly."[69] Had they been successful in this endeavor, then such success would manifest itself in CPT prices decreasing slower during the cartel period than during the periods immediately before or after the cartel period. However, as seen in Exhibit 12, the average CPT price actually fell *faster* (1.8% per quarter on average) during the alleged cartel period than after the putative cartel ended (0.6% per quarter on average).[70] Moreover, the average CPT price increased in a typical quarter in the years immediately before the alleged cartel started, but the trend reversed and the average CPT price declined in the typical quarter soon after the alleged cartel began. These trends in the average CPT price do not suggest a highly effective CPT cartel that was able to sustain material price increases to all or nearly all IPP class members as claimed by Dr. Netz.

B. No evidence that CRT profit margins increased with the onset of the alleged cartel.

64. A successful CPT cartel would have elevated the profit margins of its participants. To test this proposition, I have examined the gross profit margins of Chunghwa, the only

[69] Netz Damages Report, p.37.

[70] The average CPT price movements are measured by Fisher Price Indices calculated using CPT sales data compiled by Dr. Netz.

major CPT manufacturer[71] for which I have been able to locate consistent data on CRT-specific gross profit margins for cartel and non-cartel periods.

65. Chunghwa has no CPT-specific gross margin data that would permit a comparison of its CPT gross profit margins during the alleged cartel period with its margins outside the cartel period. However, Chunghwa's financial statements show that overall *CRT* gross profit margins (combining CPTs with CDTs) show no increase following the start of the alleged cartel in 1995. In fact, Chunghwa's average annual CRT gross margin declined from 19.9% during the six years immediately prior to the start of the alleged cartel period (1989-1994) to 18.1% during the six years immediately after the start of the alleged cartel (1995-2000).[72]

C. Industry-wide CPT capacity and production grew consistently during most of the class period.

66. Dr. Netz contends that members of the alleged cartel agreed to reduce CPT production and capacity.[73] However, according to Dr. Netz's own estimates, global CPT capacity increased each year after 1996 until 2005, and CPT capacity in 2005 was 59%

[71] Between 2000 and 2006, Chunghwa's average annual share of global CPT production placed it among the five largest suppliers. (Production share data are obtained from the back-up to Exhibit 6 of the Netz Damages Report, which contains data only for the 2000-2006 period.)

[72] Margin data for 1989-1994 are from Chunghwa's annual reports which record annual gross margins. (Chunghwa annual reports and certified translations, 1990-1995.) No data for years prior to 1989 are available. During the 1989-1994 period, Chunghwa reported only margins on all operations instead of CRT-specific operations, but Chunghwa was predominantly a CRT manufacturer at the time. Specifically, non-CRT products accounted for less than 10% of Chunghwa's revenues in these years. (See, e.g., 1994 Chunghwa Annual Report, p. 124.) Starting in 1995, Chunghwa's gross margins for CRTs are obtained from CHWA00256934 - HIGHLY CONFIDENTIAL.xls. The analysis noted here compares unweighted mean gross margins before and during the cartel period. However, weighting the annual gross margins by annual Chunghwa revenues and comparing weighted means does not alter the conclusion that the average gross margin was lower in the cartel period. Moreover, extending the analysis to include all years of the alleged cartel (instead of 1995-2000) does not alter the conclusion that the average gross margin during the alleged cartel period was lower than in the years prior to 1995.

[73] Netz Damages Report, pp. 50-1.

higher than in 1996.[74] Although CPT capacity decreased in later years, this is to be expected even in a competitive market given the declining demand for CPTs due to plasma and LCD competition in the later years of the class period. Similarly, according to Dr. Netz's own estimates, global CPT production volume grew in all but one year between 1995 and 2004, and the volume of CPT production in 2004 was 71% higher than in 1995. The median annual growth rate of CPT production was higher (5.3%) during the three years immediately after the advent of the alleged cartel in 1995 than during the three years immediately before the start of the alleged cartel (0.7%).[75]

67. In sum, straightforward evidence related to CPT prices, margins, capacity and production provide no support for Dr. Netz's view that the alleged cartel was effective in substantially elevating CPT prices.

VII. Dr. Netz's Own Analysis of CPT Overcharges Undermines Her Claim that the Alleged Cartel Had a Class-wide Impact.

68. Dr. Netz not only contends that the alleged cartel substantially elevated CPT prices but also that it did so in a manner that impacted all or most members of the IPP class.[76] In the two expert reports that I filed during the IPP class certification phase of the instant litigation, I concluded that common methods and evidence cannot be used to assess the impact of the alleged cartel on members of the proposed IPP class and that instead an individualized examination is required to determine whether any particular indirect purchaser actually paid a cartel overcharge when purchasing a given CRT finished

[74] Capacity data are extracted from the back-up material related to Exhibit 12 of the Netz Damages Report. Data prior to 1996 were unavailable in Dr. Netz's back-up materials. Data extend to 2009 but 2008 data are missing.

[75] CPT production data between 1991 and 2006 are extracted from the back-up material related to Exhibit 9 of the Netz Damages Report. Although CPT production decreased in 2005 and 2006, this is to be expected even in a competitive market given the declining demand for CPTs due to plasma and LCD competition in the later years of the class period.

[76] Netz Damages Report and Declaration of Janet S. Netz, Ph.D., in Support of Motion of Indirect-Purchaser Plaintiffs for Class Certification (hereafter "Netz Class Certification Report").

product.[77] This conclusion flows naturally from the observed heterogeneity in CRTs (CPTs as well as CDTs) and the divergent CRT price dynamics propelled by heterogeneous market forces that applied to CRTs (including various types of CPTs). It also follows logically from the unevenness of the applicability of Dr. Netz's target prices to the actual prices of the various CPTs, since those target prices are a principal mechanism cited by Dr. Netz for the alleged cartel's coordination of prices with overcharges.

69. This conclusion is further confirmed by Dr. Netz's own analysis of CPT overcharges caused by the alleged cartel. As an initial matter, the very facts that Dr. Netz estimated overcharges (and all other analyses) separately for CPTs and CDTs, and that she obtained very different estimates of CPT and CDT overcharges (9% and 22% respectively for the 1995-2006 period), imply that impact and damages for CDTs and CPTs together cannot be established using class-wide proof.

70. Moreover, the econometric model employed by Dr. Netz to estimate damages is unable to establish cartel impact on many members of the IPP class. In the next section, I describe Dr. Netz's econometric model of CPT overcharges, and I explain the fundamental flaws in her analysis that render her estimates unreliable. However, even setting aside the methodological flaws, Dr. Netz's analysis of CPT overcharges clearly undermines any claim of class-wide impact of cartel conduct because her own model of overcharges is unable to establish overcharges for large CPTs. Moreover, the same analysis finds that all CPTs (pooled together) likely had no overcharge after 1997. I explain this in the rest of this section.

A. No overcharges for large CPTs

71. Dr. Netz estimates putative overcharges for all CPTs pooled together.[78] However, making no change to her analysis other than just unbundling small CPTs from large CPTs reveals that Dr. Netz's model estimates no statistically significant overcharges for larger

[77] See Willig Class Action Reports.

[78] See Exhibit 65 of the Netz Damages Report.

CPTs, whereas it finds statistically significant overcharges for smaller CPTs. Thus, Dr. Netz's own statistical model of CPT overcharges cannot reject the proposition that the alleged cartel had no impact on larger CPTs.[79]

72. This conclusion is not surprising given the evidence (explained above) that prices of larger CPTs were constrained by alternative technologies for much of the class period, and more so than smaller CPTs. It is also consistent with my findings, presented above, that Dr. Netz has identified alleged target prices corresponding to a substantially smaller share of sales of large CPTs than sales of small CPTs, that prices of large CPTs were more likely to be below the corresponding alleged target prices than prices of small CPTs, and that changes in associated target prices were poorer predictors of changes in actual prices for large CPTs than for small CPTs.

B. No CPT overcharges after 1997

73. Dr. Netz estimates putative overcharges for all years between 1995 and 2006 pooled together, with only 2007 separated from the rest of the class period. Making no change to her analysis other than just unbundling the alleged cartel period such that her model is used to estimate potential CPT overcharges for each year of the alleged cartel activity reveals that Dr. Netz's model estimates positive and statistically significant (at the 10% level) overcharges only in 1995 and 1996. For all other years, her model implies

[79] When applied to large CPTs (26 inches or greater), Dr. Netz's damages model estimates a 3.9% overcharge during the 1995-2006 period, but it is not statistically significantly different from zero at the 10% level (and hence it is not statistically significantly different from zero at the 5% level as well). This is smaller than the 9% overcharge that she estimates for all CPTs for the same period. (I test for the statistical significance of the overcharge and not the coefficient of the 1995-2006 cartel dummy since the overcharge is what is relevant for this analysis. The annual overcharge expressed as a percentage of actual CPT prices was calculated using the same methodology as described in the Netz Damages Report Errata (p. 1). Specifically, b_t, the estimated coefficient on the year t indicator variable was first converted into a percentage of but-for CPT prices using the formula: $OC_{BF} = \exp[b_t - Var(b_t)/2]$, where $Var(b_t)$ is the estimated variance of b_t . $OC_{BF,t}$ was then converted into a percentage of actual prices using the formula: $OC_{A,t} = 1 / (1 + OC_{BF,t})$.) For CPTs no smaller than 32 inches, the estimated overcharge coefficient is 0.3% for the same period, and the estimate is also statistically insignificant. (For both definitions of "large CPTs," Dr. Netz's model estimates negative overcharges in 2007.)

negative overcharges (except in 1997 where it finds an overcharge of just 0.1%, which is statistically insignificant). This is illustrated in Exhibit 13, which shows the CPT overcharge estimated by Dr. Netz's CPT overcharge model for each year of the class period. Thus, accepting Dr. Netz's analysis necessarily implies acknowledging that IPP class members who purchased TVs after 1997 were likely not impacted by the putative cartel, and the model cannot reject the possibility that purchasers in 1997 were also not impacted.[80]

74. Moreover, using the annual estimates of alleged cartel impact illustrated in Exhibit 13, Dr. Netz's model implies that the average CPT overcharge for the entire class period is just 1.19%,[81] far less than the 8.94%[82] claimed by Dr. Netz for the class period.[83]

75. Furthermore, even the "overcharges" estimated for 1995 and 1996 by Dr. Netz's model may, in fact, have had nothing to do with the alleged cartel. Dr. Netz's quantitative analysis of target prices allegedly set by the cartel does not cite to a single CPT target

[80] Examining impact by each year of the class period may better capture the impact of the cartel on class members than an estimate that pools all years. "In class action cases where class membership varies over time, estimating an overcharge for various subperiods may lead to a more accurate estimate of overcharges for specific class members than would an estimate of the average overcharge over the entire relevant time period." (ABA Section of Antitrust Law, "Proving Antitrust Damages: Legal and Economic Issues," (2D ED. 2010), p. 204.)

[81] 1.19% is the weighted average annual overcharges estimated by Dr. Netz's model (when modified to estimate annual overcharges) for each year of the class period. Years for which Dr. Netz's model estimates negative overcharges are assumed to have had zero overcharges. Each calendar year is weighted by its share of IPP members' total CPT expenditures, as estimated by Dr. Netz. (Netz Damages Report, Exhibit 80.)

[82] 8.94% is the weighted average of Dr. Netz's estimates of CPT overcharges for the 1995-2006 period and 2007 (with the two periods weighted by their shares of IPP members' CPT expenditures).

[83] The weighted average annual overcharge implied by a model with annual cartel impact estimates need not be comparable to Dr. Netz's estimate with many years pooled together because the estimated coefficients of the various cost and demand control variables in the regression change when Dr. Netz's model is generalized to allow for varying annual overcharges.

price agreed to by the alleged cartel members in 1995, 1996 or 1997.[84] This is illustrated in Exhibit 13, in which the bar heights indicate the fraction of annual CPT sales covered by target prices identified by Dr. Netz. As this exhibit shows, the target price coverage was zero from 1995 through 1997. Moreover, although Exhibit 28 of Dr. Netz's report lists documents that she characterizes as instances in which some Defendants agreed to reduce production capacity and supply, the earliest CPT-related instance she lists is from a meeting in September 1998.

76. In contrast to the paucity of evidence of cartel activity that Dr. Netz finds in 1995-97, there exist non-collusive explanations for why prices in 1995 and 1996 were relatively high. For instance, manufacturers reported shortages of specialty glass used in CRTs in 1995 and 1996,[85] which likely would have resulted in higher CPT prices in 1995 and 1996 regardless of whether the alleged cartel was effective.[86]

VIII. Dr. Netz's Model of CPT Overcharges Is Fundamentally Unreliable and Does Not Support a Claim of Substantial Overcharges.

77. In order to estimate CPT overcharges, Dr. Netz compares CPT prices during two cartel periods (Q2 1995 through 2006 and, separately, 2007) with CPT prices during a benchmark non-cartel period. The benchmark period is comprised of two time periods pooled together: (i) the pre-cartel period from Q1 1993 through Q1 1995, and (ii) the post-cartel period from Q1 2008 to Q1 2011. In effect, Dr. Netz compares the average CPT price during each cartel period with the average price during the benchmark period. In doing so, she controls for a limited set of market factors such as LCD penetration, the

[84] This finding is based on a review of Dr. Netz's target price database ("clean_target.dta") produced as part Dr. Netz's Damages Report back-up.

[85] See, e.g., Pereira, Pedro. "Higher monitor prices looming—Shortages of cathode ray tubes, higher production costs in Japan taking a toll," *Computer Reseller News.* April 10, 1995, #625; "Corning Asahi Expanding Glass, Adding 35" *Consumer Electronics.* 10 July 1995.

[86] Dr. Netz's overcharge regression contains a control variable for glass costs, but (as explained below) it is limited to glass costs in Korea and likely does not accurately reflect global glass costs.

cost of specialty glass in Korea, CPT size and manufacturer. Dr. Netz concludes that, after controlling for these market factors, CPT prices were, on average, 9% higher during Q2 1995 through 2006 relative to the benchmark period, and that they were 3.1% higher in 2007.

78. However, Dr. Netz's econometric estimates of CPT overcharges are fundamentally unreliable for several reasons that I explain in this section.

A. The CPT industry changed fundamentally during the estimation period in ways not captured by Dr. Netz's model.[87]

79. The CPT industry changed fundamentally between 1993 and 2011.[88] For example, CRT technologies that dominated global sales of televisions in the early years were displaced by LCD (and to a lesser extent plasma) technologies by the end of the alleged cartel period. Moreover, the mix of characteristics of CPTs changed substantially during the relevant period. For example, as noted above, manufacturers introduced flat CPTs in place of curved CPTs in order to better compete with flat screen technologies such as LCD and plasma, thereby increasing the share of flat CPTs. For instance, Dr. Netz's data record no flat CPT sales by Panasonic Corporation during the years prior to the start of the alleged cartel, but their flat CPT sales increased during the alleged cartel period such that flat CPTs accounted for about 62% of their CPT sales during that period.[89] Not only

[87] In addition to the problems described in this section about Dr. Netz's estimation of overcharges, the CPT sales dataset that she uses for her overcharge analysis has serious shortcomings. [redacted] SDI, one of the largest CPT manufacturers, is missing from both the pre-cartel and post-cartel periods. Dr. Netz has data on Thomson, another major CPT manufacturer, for only four years during the alleged cartel period and none for the years prior to or after the alleged cartel. Dr. Netz has performed no analysis of the implications of these data gaps on her overcharge estimates.

[88] Dr. Netz uses data from 1993 through 2011 in order to estimate CPT overcharges.

[89] Estimates of the revenue share of flat CPTs sold by Panasonic Corporation are based on CPT sales data compiled by Dr. Netz. Dr. Netz's data record the first flat CPT sale by Panasonic Corporation in Q2 2000. The comparison of the incidence of flat CPTs at Panasonic Corporation is only between the alleged cartel period and the period prior to that ("pre-cartel period" or "pre-

(footnote continued …)

did the mix of product characteristics change, the mix of CPT manufacturers also changed during the class period such that by the end of the alleged cartel period manufacturers such as Hitachi had exited the industry or reconfigured their participation.[90]

80. The changes in industry conditions during the class period render Dr. Netz's model unstable and hence unreliable. To see why, it is important to recognize a fundamental assumption of the dummy variable model employed by Dr. Netz to estimate CPT overcharges: she assumes that she has fully controlled for all material changes in market conditions between the alleged cartel period and the benchmark non-cartel periods such that the only material remaining difference between the cartel and non-cartel periods is the absence of collusive conduct in the benchmark period. If, however, market conditions materially differed between the cartel and benchmark periods in ways that are not fully accounted for by Dr. Netz, then the difference in CPT prices between the alleged cartel and non-cartel periods, i.e., the "overcharge" estimated by Dr. Netz's dummy variable model, would reflect those unaccounted for differences in market conditions and not just the impact of the alleged cartel. If so, Dr. Netz would conflate changes in market conditions with the impact of the alleged cartel on CPT prices.

81. In fact, Dr. Netz's model does fail to control for salient changes in market conditions during the estimation period. For example, her model does not control for changes in

(… footnote continued)

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period") because I understand that MTPD wound down its CPT business in 2007. More generally, Dr. Netz's data on all CPT manufacturers present during both the pre-cartel and alleged cartel periods show that flat CPTs had a 64.1% share of CPT sales during the alleged cartel period, whereas the data record no flat CPT sales by any manufacturer during the pre-cartel period. When I further limit the data to manufacturer- CPT size combinations that were present in both the pre-cartel period and the alleged cartel period, I find that the share of flat CPTs was 57.6% during the claimed cartel period. (The share of flat CPTs during the cartel period is estimated only for observations where the CPT shape is recorded in the data.)

[90] I understand that Hitachi Defendants ceased manufacturing CPTs by April 2002 and ceased selling CPTs by March 2003. Moreover, I understand that Philips and LG transferred their CRT operations to LPD, a joint venture established in 2001. Similarly, I understand that Panasonic Corporation and Toshiba Corp. transferred their CRT operations to MTPD.

product quality over time, and thus it does not recognize the fact that CPT manufacturers shifted production from curved to flat CPTs (for instance) during this period, although Dr. Netz acknowledges that CPT shape is a major determinant of CPT prices[91] and that changes in product mix are relevant for her analysis.[92]

82. Since prices for flat CPTs were higher than for curved CPTs, the shift to flat CPTs would likely have increased the prices of CPTs during the class period (when there were more flat CPTs) relative to their prices during the pre-class period. In fact, the data used by Dr. Netz show that the prevalence of flat CPTs (measured by the fraction of revenues accounted for by flat CPTs) was greater during the class period than before or after the

[91] Netz Damages Report, p. 7.

[92] At her deposition, Dr. Netz acknowledged that the mix of CRTs sold changed over time and that the change was relevant for her analysis. Specifically, she testified that more flat and widescreen CRTs were sold over time and that these types of CRTs had higher prices (all else being equal). (Deposition of Dr. Janet Netz, June 27, 2014 ("Netz Deposition"), pp. 72-74.) She also testified that although she has no direct controls for the change in product mix in her overcharge regression, nonetheless her regression model contains time-trend variables that would "in part" control for the impact of the changes in product mix. (Netz Deposition, p. 75.) However, Dr. Netz presents no evidence that these time-trend variables effectively capture the price impact of changes in CPT quality. In fact, these trend variables only capture market changes that follow a very particular shape implied by the functional form that she uses. Any market changes that do not follow this particular shape would not be properly controlled for in her analysis.

For example, Dr. Netz estimates a convex trend in her CPT overcharge regression that increases monotonically (i.e., consistently) during the entire data period (from 2003 through Q1 2011). Dr. Netz provides no evidence that the change in product mix followed this particular pattern over time. Indeed, the fact that manufacturers such as IRICO and LPD, whose data are used by Dr. Netz, show a *decrease* in their share of flat CPTs between the alleged cartel period and the post-cartel period is inconsistent with the trend variable used by Dr. Netz, and it is evidence that the change in product mix is not properly controlled for by Dr. Netz's trend variables. (Neither LPD nor IRICO have pre-period data.) More generally, when I compare the share of flat CPT sales revenues for all manufacturers in Dr. Netz's data that had sales during the claimed cartel period and the post-cartel period, I find that flat CPTs' share of total CPT revenue was smaller (35.7%) in the post-cartel period than in the alleged cartel period (47.4%). When I limit the analysis to manufacturer-size combinations that were sold during the alleged cartel period and in the post-cartel period, I find that the share of flat CPT sales fell from 56.3% during the claimed cartel period to 35.7% during post-cartel period. (All estimates of flat CPT sales shares are estimated only for observations where the CPT shape is known.)

class period.[93] Because Dr. Netz's model of CPT overcharges does not recognize this change in the quality mix of CPTs, it mistakenly attributes higher prices of CPTs during the class period to the deleterious effects of the alleged cartel rather than to the increased prevalence of the higher priced flat CPTs. Consequently, Dr. Netz likely over-estimates the impact of the putative cartel on CPT prices.

83. The importance of controlling for material changes in market conditions when using a dummy variable model to estimate damages is well recognized by economists, as evidenced by the following excerpt from a treatise on the use of quantitative methods:

> [T]he omission of relevant variables [from a dummy variable regression] can bias the results. If, for example, costs were high during those periods of alleged wrongful behavior because of the influence of variables not included in the regression model, or if demand grew more inelastic during that period in ways not captured by the included demand-side variables, then a dummy variable reflecting the likely effect of wrongful behavior might have a large positive coefficient for reasons unrelated to the existence of the alleged conspiracy.[94]

84. Even for those market factors that Dr. Netz attempts to control for in her estimation model, her model assumes that their relationship with CPT prices was stable (i.e., the same) throughout the alleged cartel and benchmark periods. However, if the relationship between these market forces and CPT prices changed during the 18-year estimation period, then the fundamental assumption of stability between the cartel and non-cartel periods would be violated.

85. For example, Dr. Netz includes the GDP of and unemployment in OECD economies in her regression. These variables are expected to control for changes in demand for

[93] See *supra* notes 89 and 92.

[94] Rubinfeld, D.L. "Quantitative Methods in Antitrust," in 1 *Issues in Competition Law and Policy*, 723 (ABA Section of Antitrust Law 2008), p. 740.

CPTs as economic conditions in major CPT consuming markets changed over time. However, the impact of the Great Recession in 2008-09 (after the alleged cartel ended) on CPT demand and prices is not likely to be the same as the impact of the recession in 2000 (during the alleged cartel), not just because of the greater magnitude of the 2008 recession but also because by 2008 CRT TVs had largely been displaced by LCD and plasma TVs. The extent to which consumers responded to similar changes in their income and employment status by buying more or less CPT TVs was not likely to be the same in 2008 as it was in 2000, but this is what Dr. Netz's model assumes.

86. More generally, changes (between the cartel and non-cartel periods) in the relationships between CPT prices and market variables that explain CPT prices result in Dr. Netz conflating the impact of the alleged cartel on CPT prices with changes in market conditions. Put simply, if Dr. Netz's model is not stable, then her benchmark period is not a reliable benchmark for damages estimation.

87. The importance of model instability due to changes in the relationships between market variables has long been recognized in economics. The impact of such changes (also termed "structural breaks" in the literature) is described thusly in a well-known econometrics textbook:

> A … nonstationarity arises when the population regression function changes over the course of the sample. In economics, this can arise for a variety of reasons, such as changes in economic policy, changes in the structure of the economy, or an invention that changes a specific industry. If such changes or "breaks" occur, then a regression model that neglects those changes can provide a misleading basis for inference and forecasting.[95]

88. Economists have recognized the relevance of model stability in the context of dummy variable models used for damage estimation:

[95] Stock, J.H., and Watson, M.W. (2011) *Introduction to Econometrics. 3rd edition.* Addison-Wesley. p. 556.

> There is, however, an important limiting assumption implicit in the dummy variable approach. That assumption is that the overall behavior of the regression model can be modeled in precisely the same way during both the conspiratorial and non-conspiratorial periods. This may be a reasonable assumption in some cases, but it should not be made without substantial thought. If prices are determined in rather complex ways, the use of a single dummy variable that will reflect mean differences between the benchmark and but-for periods may be too simplistic.[96]

89. Direct evidence of the instability of Dr. Netz's model is found in two tests. First, when forming her benchmark periods, Dr. Netz pools together the nine quarters prior to the start of the alleged cartel with the thirteen quarters after the alleged cartel ended. In doing so, Dr. Netz implicitly assumes that her estimation model is stable between these two periods, but she neither tests this assumption nor provides any supporting evidence. Put differently, she assumes, without support, that market conditions remained sufficiently unchanged so that the relationship between CPT prices and GDP (for instance) was the same between the pre-class period (Q1 1993 to Q1 1995) and the post-class period (Q1 2008 to Q1 2011) despite the 18-year gap between the start of the pre-class period and the end of the post-class period and the enormous changes in CPT industry conditions during this time.

90. If she were correct in her assumption, then the two benchmark periods would imply approximately similar overcharges for CPTs. They do not. When Dr. Netz's model is applied so that only the post-class period is used as a benchmark (and the pre-class period is excluded altogether from the analysis), the estimated overcharge is 1.7% (which is not statistically significant and hence one cannot reject the possibility that the overcharge is zero) for the 1995-2006 period and -4.4% (which is statistically significant) for 2007. In contrast, when Dr. Netz's model is applied so that only the *pre*-class period is used as a

[96] See Rubinfeld, *supra* note 94, p. 740.

benchmark (and the post-class period is excluded altogether from the analysis), her model estimates a statistically significant overcharge of 14% for both the 1995-2006 period and 2007. Thus, the two benchmark periods are clearly fundamentally different, which is not surprising given the enormous changes in market conditions during the relevant period. Thus, Dr. Netz's model is revealed as unstable.

91. I have also tested the stability of Dr. Netz's model by employing a standard statistical test of structural breaks. This test compares the relationships between CPT prices and the market demand and cost controls (for example) between the alleged cartel and non-cartel periods as defined by Dr. Netz. For example, the test would compare the effect of a 5% change in the unemployment rate in OECD economies on CPT prices during the alleged cartel period with the impact of a similar change in the unemployment rate during the non-cartel period. If Dr. Netz's model were stable, then the statistical test would be unable to reject within a statistical margin of error the proposition that the impact of changes in unemployment on CPT prices was comparable in the alleged cartel period and the benchmark period. However, the test emphatically rejects the proposition that Dr. Netz's model is stable between the alleged cartel and non-cartel periods.[97]

92. In sum, Dr. Netz's dummy variable model does not control for material changes in market conditions, and hence it conflates changes in market conditions with the impact of the alleged cartel on CPT prices.

B. Dr. Netz's model implies an implausible pattern of CPT damages.

93. As explained above, Dr. Netz's model estimates that CPT overcharges occurred only during the first three years of the alleged cartel but not thereafter. Nearly all the

[97] A Chow test of the null hypothesis that covariates other than the cartel dummies in Dr. Netz's CPT overcharge model are stable between the alleged cartel and non-cartel periods is rejected at the 0.001% level of statistical significance. The test is conducted as follows: I first interact a single cartel dummy variable (which equals 1 between Q2 1995 and Q4 2007 and zero otherwise) with each of the control variables (including fixed effects of CPT size-manufacturer combinations) in Dr. Netz's model. I then include these interaction variables in Dr. Netz's model, estimate the extended model, and then test the joint hypothesis that the coefficients of these interaction variables equal zero.

overcharges are estimated to have occurred in 1995 and 1996. However, as also explained above, Dr. Netz is unable to find evidence of agreements between Defendants related to target prices and supply reductions in 1995 and 1996. Moreover, there are non-collusive explanations for CPT price increases in 1995 and 1996. The inability of Dr. Netz to find any correspondence between the timing of her estimated CPT overcharges and the incidence of key activity (e.g., agreements to set target prices or to reduce capacity) by the alleged cartel is a further indication of the unreliability of her approach to estimating CPT overcharges.

C. Dr. Netz's CPT overcharge estimates are inconsistent with available data on profit margins.

94. Chunghwa is the major CPT manufacturer for which I have been able to locate CPT-related (or CRT-related) profitability (gross margin) and investment data for the longest time period. Applying Dr. Netz's CPT overcharge estimates to Chunghwa leads to the conclusion that Chunghwa would have persistently operated at a loss in the but-for world. Specifically, Dr. Netz's but-for CPT prices imply that Chunghwa's but-for CPT gross profit margins would have been negative in seven of the twelve years between 1995 and 2006 (the period for which data on CPT margins are available for Chunghwa) with an average annual but-for gross margin equal to -2.2% during these years.[98]

95. [redacted] Yet Dr. Netz's estimates of CPT and CDT overcharges imply that

[98] [redacted]

(footnote continued …)

Chunghwa's overall CRT gross margin in the but-for world would have been negative in seven of eight years between 1999 and 2006, and the average annual but-for gross margin would have been -7.8%.[100] Chunghwa's *operating* margins, which account for overhead costs, would have been even more negative in the but-for world postulated by Dr. Netz. It would be economically irrational for a firm facing persistent losses not to scale back investment, capacity and production, but this supply reduction is not incorporated into Dr. Netz's analysis, which is further evidence of the unreliability of her overcharge analysis.

D. Dr. Netz provides no basis for her assumption that her estimated global CPT price overcharge is a reliable estimate of the overcharge paid by members of the IPP class in the U.S.

96. Dr. Netz estimates CPT overcharges using global CPT prices, and she then applies this estimated overcharge (through claims of pass-through) to TV purchases by members of the U.S.-based IPP class. Thus, Dr. Netz assumes that the global CPT overcharge that she estimates is a reliable estimate of the overcharge paid by U.S. TV consumers. However, she provides no evidence or analysis to support this assumption. This is a notable omission for several reasons.

- First, a substantial volume of CPTs were manufactured in North America, and the domestic production exceeded CPT imports into North America.[101]

(… footnote continued)

[redacted]

[101] See *supra* note 8. See also MTPD-0202360.ppt, p. 13. Dr. Netz acknowledges that only a minority (25% or less between 1995 and 2003) of CPTs sold in North America were imports. (Netz Damages Report, p. 74.)

- Second, among the CPT target prices that Dr. Netz has identified and used in her quantitative analyses of target prices, she has not identified any that she contends specifically applied to CPTs sold in North America.
- Third, even if the CPT target prices that Dr. Netz has identified applied to CPTs sold in North America, such target prices applied only to a very small fraction of CPTs sold in North America – smaller than the worldwide coverage of such target prices. Specifically, whereas the CPT target prices identified by Dr. Netz applied to at most only 17.5 % of CPTs sold outside North America during the class period, they applied to an even smaller fraction of North American CPT sales, i.e. at most 9.9% (see Exhibit 6).[102, 103] This is due to the fact that CPTs sold in North America were, on average, larger than CPTs sold in the rest of the world (as explained below), and (as explained above) larger CPTs were less likely to have target prices associated with them (per Dr. Netz's data).
- Fourth, I find that changes in the alleged target prices were even poorer predictors of changes in actual prices for CPTs sold in North America than in the rest of the world. Specifically, whereas changes in target prices explain only 3.9% of the variation in changes in the prices of CPTs sold outside North America, they explain an even smaller share, 2.6%, of the variation in changes in North American CPT prices. Similarly, whereas, on average, a 5% change in the alleged applicable target price identified by Dr. Netz is associated with only a 0.95% increase in the actual prices of CPTs sold outside North America during the same quarter, it is associated with an even lower increase, 0.67%, in the actual prices of CPTs sold in North America during the same quarter. This is again due to the fact that

[102] These coverage estimates are based on the corrections to Dr. Netz's flawed methodology for estimating target price coverage that I have described above in § V.A.

[103] Similarly, the CPT target prices identified by Dr. Netz applied to at most only 10.1 % of *revenues* from CPTs sold outside North America during the class period compared to at most 4.6% of *revenues* from CPTs sold in North American during the same period.

CPTs sold in North America were, on average, larger than CPTs sold in the rest of the world (as explained below), and (as explained above) changes in the prices of larger CPTs were less likely to be correlated with changes in target prices associated with them than smaller CPTs.

- Fifth, CPTs sold in North America were substantially more likely to be large than CPTs sold in the rest of the world. For example, 53% of CPTs sold in North America during the class period were large CPTs, whereas the corresponding share in the rest of the world was only 19%. As explained above, the alleged cartel is less likely to have impacted prices of large CPTs, and hence the impact on CPTs sold in North America may well have been smaller.
- Sixth, based on a comparison of divergent prices paid by Sharp Electronics Corporation ("Sharp") for CPTs in North America and in Asia, Professor Hausman, the expert economist in the instant matter for Sharp, a Direct Action Plaintiff, has focused on estimating overcharges in a North American CPT market separate from the rest of the world.[104]

97. In sum, there are sound economic reasons to conclude that the North American CPT marketplace differed in material ways from the rest of the world. Despite these reasons, Dr. Netz has provided no quantitative analysis to support the view that her estimate of worldwide CPT overcharges is a reasonable estimate of overcharges of TVs sold to IPP class members in the U.S.

98. In fact, when Dr. Netz's CPT overcharge model is estimated using only data on CPTs sold in North America, the model estimates a 5.14% overcharge for the alleged cartel period, which is substantially less than the 8.94% that Dr. Netz estimates using worldwide data for the same period.[105] Thus, even setting aside the basic flaws with Dr.

[104] Expert Report of Professor Jerry Hausman, April 15, 2014 (hereafter "Hausman Report"), ¶15.

[105] These overcharges are the weighted average overcharge during (a) Q2 1995-Q4 2006 and (b) 2007.

Netz's model of CPT overcharges, her model estimates substantially smaller overcharges for CPTs sold in North America.

IX. Modifying Dr. Netz's Model to Better Control for Changes in CPT Industry Conditions Materially Reduces Her CPT Overcharge Estimates.

99. Dr. Netz purports to estimate a single average overcharge for all years between 1995 and 2006. However, since market conditions changed materially over time (e.g., the advent of flat screen competition after 2000), it is highly likely that the effectiveness of the alleged cartel varied over time. Indeed, as explained above, when Dr. Netz's model is used to estimate overcharges for each year in the class period, it predicts positive overcharges only for the first three years (1995-1997) of the class period. Moreover, allowing the CPT overcharge estimates in Dr. Netz's model to vary by year produces overcharge estimates that average just 1.19% for the entire class period (1995-2007), far lower than Dr. Netz's estimate of 8.94% for the same period.[106] In this section, I explain that even when CPT overcharges are estimated for all years between 1995 and 2006 pooled together (as Dr. Netz does), modifying her CPT overcharge model to better control for changes in market conditions leads to estimated CPT overcharges that are closer to the estimate produced by the annualized version of her model.[107]

100. Although economic logic implies that manufacturing costs are a key determinant of pricing, Dr. Netz controls only for the cost of specialty glass in Korea;[108] she controls

[106] As noted earlier, the weighted average annual overcharge implied by a model with annual cartel impact estimates need not be comparable to Dr. Netz's estimate with many years pooled together because the estimated coefficients of the various cost and demand control variables in the regression change when Dr. Netz's model is generalized to allow for varying annual damages.

[107] In her damages report filed on April 15, 2014, Dr. Netz made a calculation error that inflated her estimate of CPT overcharges. After being questioned about this error at her deposition, Dr. Netz filed an errata report on July 3, 2014 in which she corrected this mistake.

[108] Dr. Netz relies on a Korean glass cost producer price index (PPI) provided by the Bank of Korea (the Korean central bank). According to relevant documentation on the bank's web site,

(footnote continued …)

for no other manufacturing or distribution costs. As explained earlier, Dr. Netz provides no support for her assumption that her estimates of overcharges associated with global CPT prices provide reliable estimates of overcharges paid by IPP class members. Nonetheless, even if one were to maintain her assumption of a globally integrated CPT marketplace and her focus on Korea, it makes economic sense to add the following market variables to Dr. Netz's CPT pricing regression model: a global shipping cost index (because Dr. Netz claims that a substantial volume of CPTs were shipped across countries[109]), an index of labor cost in Korea (because labor costs were an important component of the manufacture of CPTs[110]), and the Korean Won-U.S. dollar exchange rate (because to the extent such imports occurred, exchange rate fluctuations likely affected the cost of importing CPTs and TVs from Korea to the U.S.[111]). Economic logic suggests that these supply-side variables likely affected CPT prices and thus including

(… footnote continued)

each PPI series "measures the developments of the prices of domestic goods and services sold by producers." (Bank of Korea web site, accessed on June 20 2014, http://ecos.bok.or.kr/download/Guide%20to%20Economic%20Statistics%20Compiled%20by%20the%20BOK%20(as%20of%20Nov%202013).pdf., p.39) At her deposition, Dr. Netz testified that the Korean glass cost PPI is "closely correlated" with glass costs in several other countries. (Netz deposition, p. 84.) However, a comparison of the Korean glass cost metric used by Dr. Netz and several available glass cost metrics for Japan and the U.S. during the relevant period shows that the Korean glass PPI often deviated from the Japanese and U.S. glass variables for extended time periods. Consistent with this, an analysis of correlations between the Korean glass cost metric used by Dr. Netz and the glass cost metrics in Japan and the U.S. having the longest available time series data shows that quarterly changes in the Korea glass costs and changes in glass costs in Japan and the U.S. were not correlated in a statistically significant manner (at the 10% level). (For this analysis, I used the following glass cost series since they were available for the entire 1993-2011 period when CPT data are available: Japan Scientific Glass Instrument PPI, Japan Float Glass PPI and the U.S. Pressed and Blown Glass PPI.)

[109] Netz Damages Report, p. 74. (The global shipping cost index -- the Baltic Dry Index -- is obtained from Bloomberg LP. The index provides an assessment of the cost of moving major raw materials by sea).

[110] See, e.g., 010_LPD-NL-00140679-692.ppt at pp. 6-7, 14. The Korean labor cost index that I use is a metric of labor costs in Korean manufacturing recorded by the OECD.

[111] North America consumed 20% or more of global CRT TVs during most years of the class period. (Exhibit 47, Netz Damages Report.)

these variables in Dr. Netz's CPT pricing regression would better control for changes in market conditions that affected CPT prices.[112] I have also added sales in U.S. electronics retail stores as a proxy for TV demand, which may well have affected CPT prices.[113, 114]

101. Adding these market demand and supply variables to Dr. Netz's model, but otherwise leaving her analysis unchanged, leads to a 2.3% overcharge estimate (which is not statistically significant at the 10% level) instead of the 9.0% overcharge for the 1995-2006 period that Dr. Netz's less explanatory model obtained. For 2007, the modification reduces the overcharge from 3.1% to -3.8%, which is statistically significant at the 5% level. Even these estimates, which are produced only by maintaining Dr. Netz's flawed assumption that changes in the mix of CPT products over time did not materially affect the analysis, are likely to be an inflated estimate of overcharges. Although these modifications improve her analysis, Dr. Netz's analysis of CPT overcharges remains fundamentally unsound (for the reasons explained above), and the modifications explained in this section do not remedy the fundamental flaws in her CPT overcharges analysis.

[112] On average, increases in shipping costs and Korean labor costs were likely to be associated with increases in CPT prices. Increase in the Korean Won-U.S. dollar exchange rate (i.e., the number of Won per U.S. dollar) represents an appreciation of the dollar against the Won. Since at least some Korea-based vendors' supply contracts set prices in Won, an appreciation of the U.S. dollar against the Won was likely to lead to a decrease in dollar-denominated CPT prices. (About 42% of SDI's sales were denominated in Won during the 1998-2007 period for which SDI sales data are available in the data used by Dr. Netz to estimate overcharges.)

[113] This variable estimates sales at U.S. electronics and appliance stores, and it is compiled by the U.S. Census Bureau. (These data were also used by Professor Jerry Hausman, the expert economist in the instant matter for Sharp, a Direct Action Plaintiff, in his expert report. (Hausman Report, ¶ 61.)

[114] Once added to Dr. Netz's regression, each of these variables appears with the sign predicted by economic logic, and they are jointly statistically significant at the 1% level (i.e., an F-test of the joint hypothesis that the coefficients of all the additional variables equal zero is rejected at the 1% level of significance).

X. Conclusions

102. In sum, I have reached the following key conclusions:

a) Market conditions for CPTs differed materially from conditions for CDTs. As such, it makes economic sense to analyze the impact and damages of the alleged cartel separately for CPTs and CDTs.

b) Salient characteristics of the CPT industry were not conducive to effective and sustained class-wide elevations of CPT prices resulting from collusion.

c) Defendants' conduct was inconsistent with a sustained and effective CPT cartel.

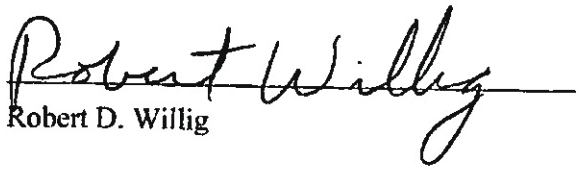
d) Straightforward evidence on CPT prices, margins and capacity do not support Dr. Netz's claim of a highly successful CPT cartel.

e) Dr. Netz's model of CPT overcharges undermines her claim that the alleged cartel had a class-wide impact because it finds potentially no damages after 1997 and potentially no damages for large CPTs.

f) Dr. Netz's model of CPT overcharges is fundamentally unreliable and does not validly support a claim of substantial overcharges. In particular, Dr. Netz's model crucially assumes that the model includes all material economic determinants of CPT prices and also that the underlying relationships between the economic factors and CPT prices did not change materially during the 18-year estimation period. As such, the model assumes that the only reason (after controlling for the included economic factors) that prices were higher during the class period is the alleged collusive conduct by manufacturers. However, standard tests show that relationships between CPT prices and the economic variables included in Dr. Netz's model were not at all stable during the 18-year period (consistent with dramatically changing market conditions for CPTs). Moreover, the model excludes basic economic determinants (such as product quality) of CPT prices. For both these reasons, Dr. Netz's model produces completely unreliable estimates of collusive overcharges.

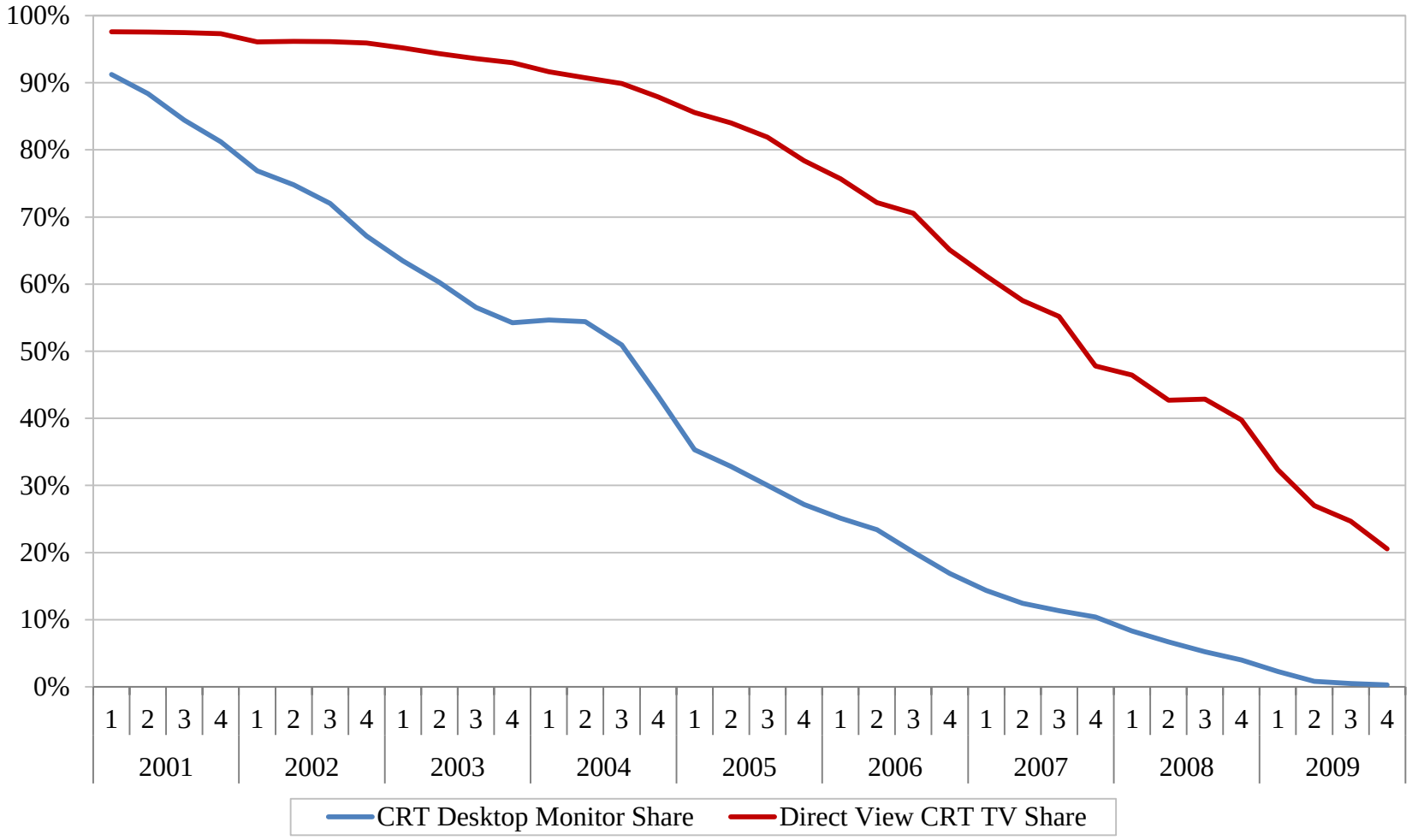
g) Despite these fundamental flaws, if Dr. Netz's model were to be used to estimate CPT overcharges, then her model should be modified to better control for changes in market conditions. Making reasonable modifications to her model to include relevant economic variables and better control for changes in market conditions result in an estimated CPT overcharge of 2.3% during the 1995-2006 period and a negative overcharge in 2007. Although these corrections improve Dr. Netz's model of CPT overcharges, they do not remedy the fundamental flaws described in this report.

Executed on August 5, 2014



Robert D. Willig

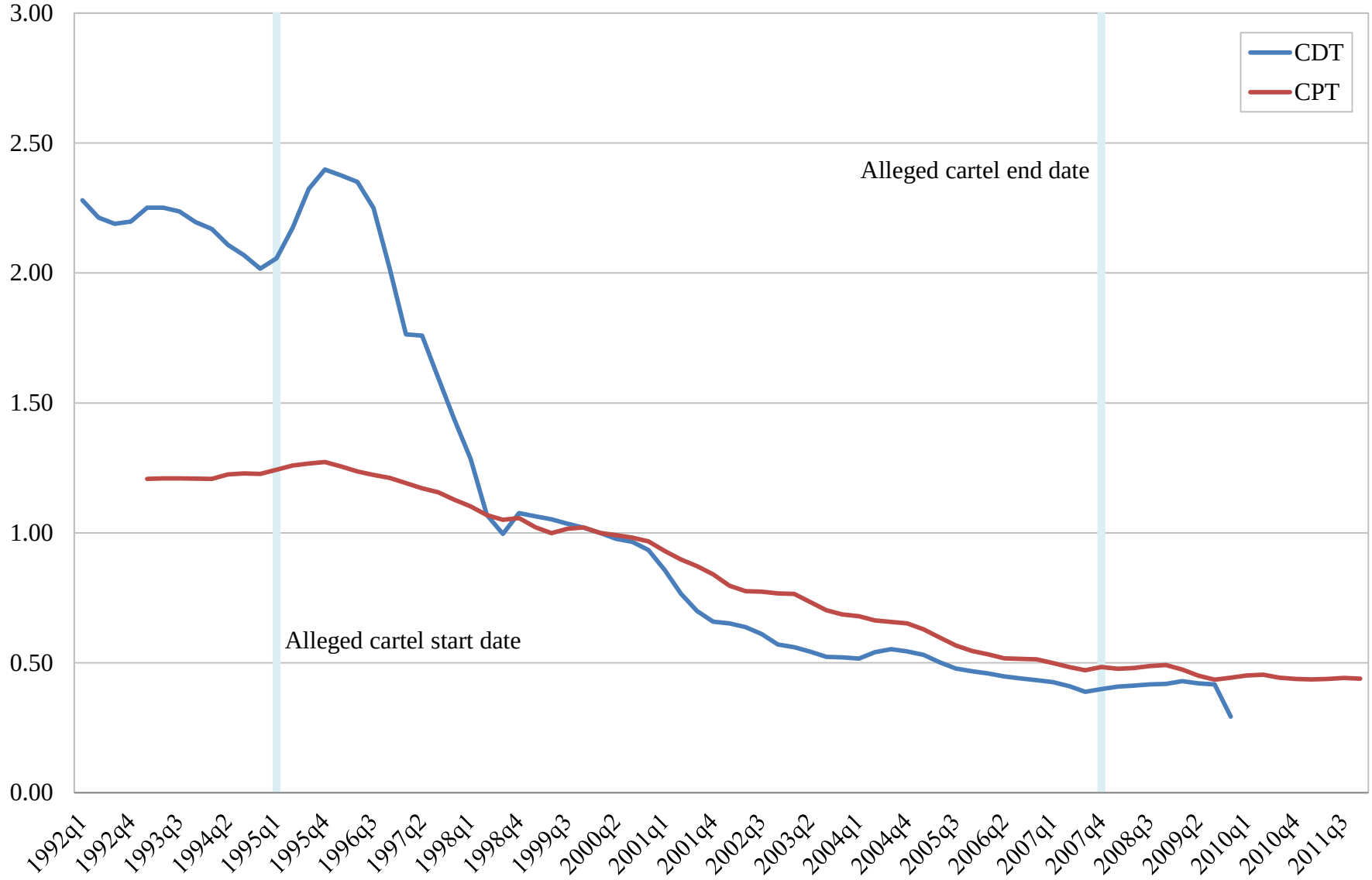
Exhibit 1: CRT Share of Worldwide Finished Product Sales by Application (2001-2009)



Sources: (1) iSuppli Worldwide Monitor Market Tracker Database; (2) iSuppli Television Systems Market Tracker Database.
Notes: (1) Direct View CRT TV Share represents CRT TV shipments as a percentage of CRT, LCD, plasma, and projection TV shipments; (2) CRT Desktop Monitor Share represents CRT monitor shipments as a percentage of CRT and LCD monitor shipments.

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Exhibit 2: Fisher Indices of Global CPT and CDT Prices

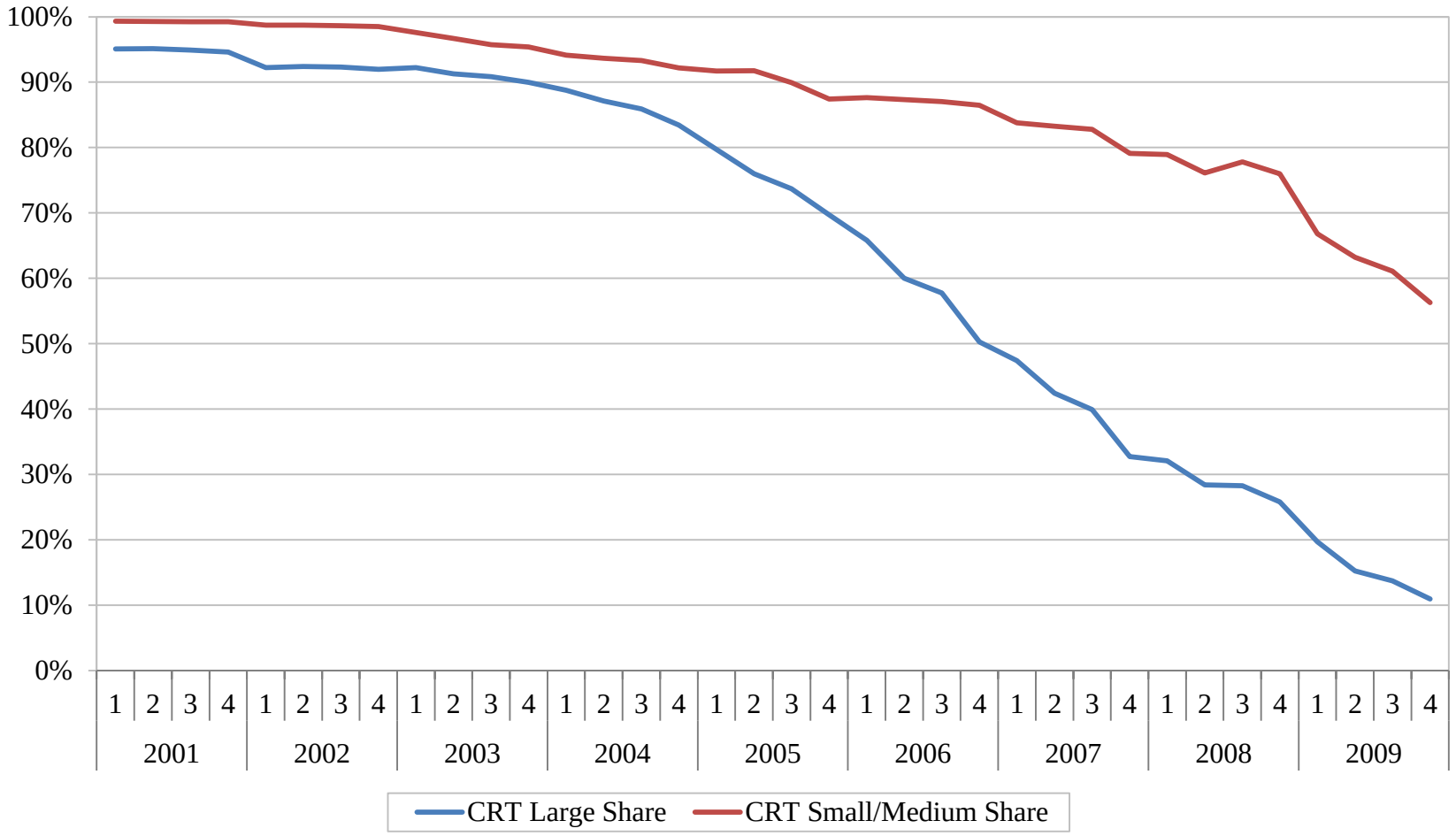


Source: Global CRT sales data for Chunghwa, Daewoo, Hitachi, IRICO, LGE, LPD, Mitsubishi, MTPD, Panasonic Corporation, Philips, SDI, Samtel, Thai CRT, Thomson, and Toshiba Corp.

Exhibit 2: Notes for Fisher Indices of Global CPT and CDT Prices

Notes:
(1) The global CRT sales data range from Q1 1992 to Q4 2011;
(2) The quarter-to-quarter change in the Fisher Price Index for CDTs/CPTs represents an average across all CDT/CPT models and customers of the changes in the prices paid by each customer for each model; the price changes across quarters *t-1* and *t* are averaged in two ways - once using the quarter *t-1* sales volumes and once using the quarter *t* sales volumes - and the change in the Fisher Price Index represents the geometric mean of the two average price changes;
(3) Each index is set to 1.0 in Q1 2000;
(4) Prices were excluded as outliers as follows: for each quarter in which a given CRT model was sold to a given customer, the average quarterly price change was calculated between the given quarter and the previous quarter in which the same model was sold to the same customer. Price changes that were less than the 25th percentile of the distribution of price changes across all defendants minus 3 times the interquartile range of that distribution or greater than the 75th percentile of the distribution plus 3 times the interquartile range were flagged as "very large price decreases" or "very large price increases," respectively. Prices for a given model, customer, and quarter were excluded as outliers if: (a) the price for the model and customer experienced a very large decrease in the given quarter followed by a very large increase in the next quarter in which that model was sold to that customer, or vice versa; (b) it was the first quarter in which the model was sold to the customer and the price experienced a very large increase or decrease in the next quarter in which that model was sold to that customer; or (c) it was the last quarter in which the model was sold to the customer and the price experienced a very large increase or decrease from the previous quarter in which that model was sold to that customer;
(5) The following observations were excluded: (a) observations for which the manufacturer, application, size, model number, or customer name was missing; (b) sales between integrated entities that sold CRTs; and (c) observations identified by Dr. Netz as outliers.

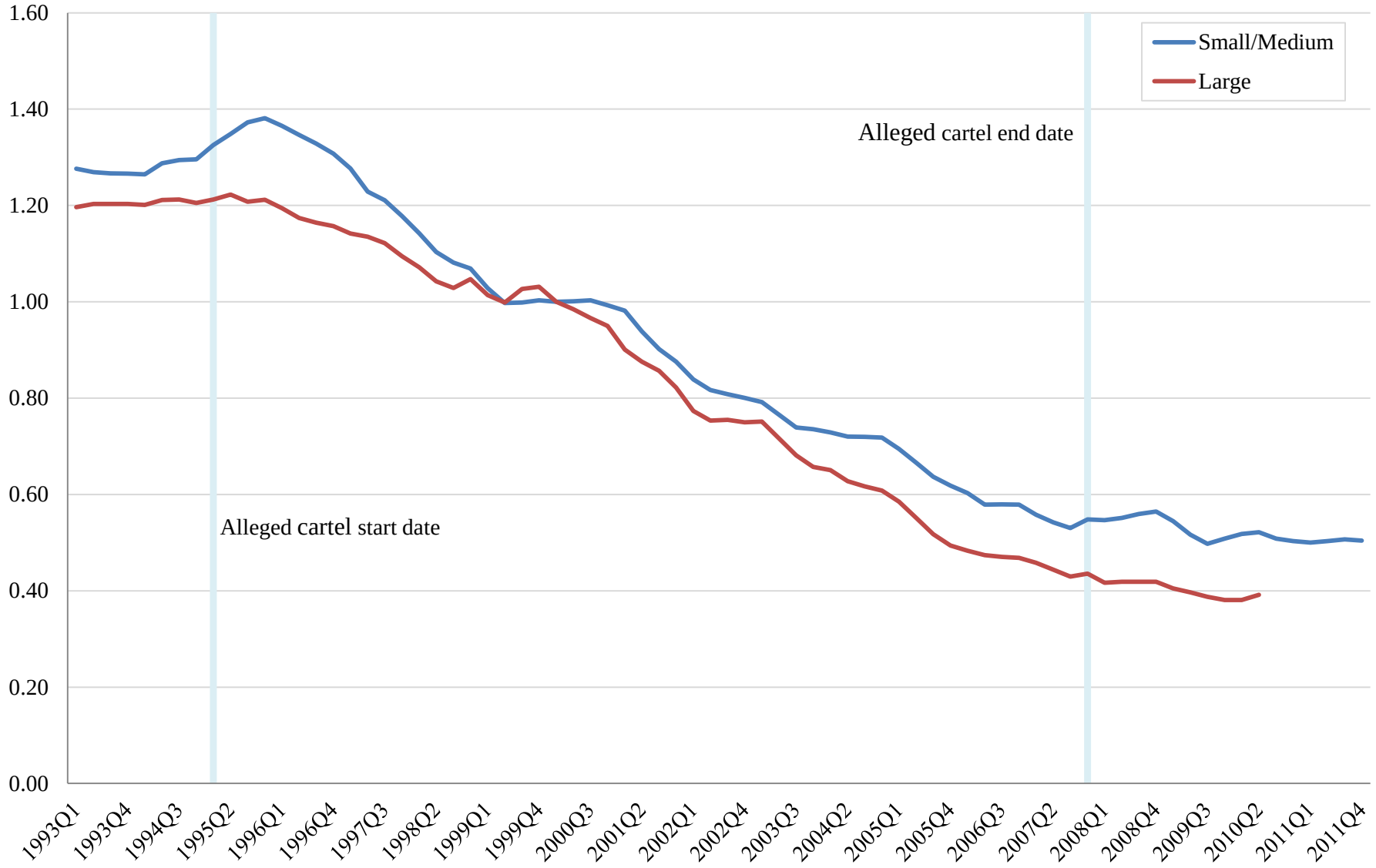
Exhibit 3: CRT TV Share of Worldwide TV Sales (by TV Size)
2001-2009



Source: iSuppli TV Systems Market Tracker.
Notes: (1) The size categories are defined as follows: Small/Medium (0-24"), Large (25" or greater); (2) Projection TVs are considered Large; (3) The shares represent worldwide Large (or Small/Medium) CRT TV shipments as a percentage of worldwide Large (or Small/Medium) CRT, LCD, projection, and plasma TV shipments.

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Exhibit 4: Fisher Indices of Global CPT Prices by Size Category

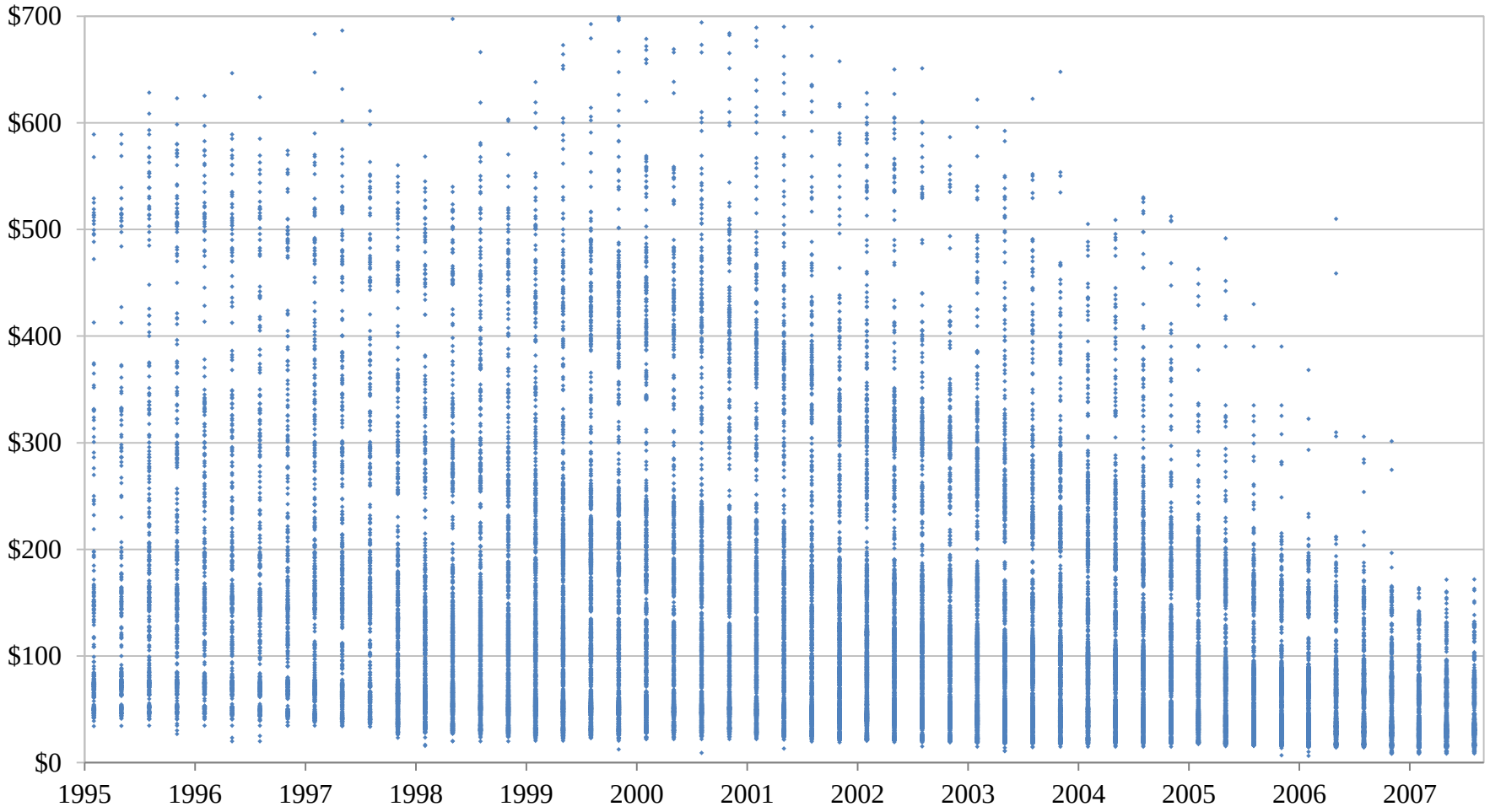


Source: Global CRT sales data for Chunghwa, Daewoo, Hitachi, IRICO, LGE, LPD, Mitsubishi, MTPD, Panasonic Corporation, Philips, SDI, Samtel, Thai CRT, Thomson, and Toshiba Corp.

Exhibit 4: Notes for Fisher Indices of CPT Prices by Size Category

Notes:
(1) The global CRT sales data range from Q1 1992 to Q4 2011;
(2) The quarter-to-quarter change in the Fisher Price Index for CDTs/CPTs represents an average across all CDT/CPT models and customers of the changes in the prices paid by each customer for each model; the price changes across quarters *t-1* and *t* are averaged in two ways - once using the quarter *t-1* sales volumes and once using the quarter *t* sales volumes - and the change in the Fisher Price Index represents the geometric mean of the two average price changes;
(3) Each index is set to 1.0 in Q1 2000;
(4) Prices were excluded as outliers as follows: for each quarter in which a given CPT model was sold to a given customer, the average quarterly price change was calculated between the given quarter and the previous quarter in which the same model was sold to the same customer. Price changes that were less than the 25th percentile of the distribution of price changes across all defendants minus 3 times the interquartile range of that distribution or greater than the 75th percentile of the distribution plus 3 times the interquartile range were flagged as "very large price decreases" or "very large price increases," respectively. Prices for a given model, customer, and quarter were excluded as outliers if: (a) the price for the model and customer experienced a very large decrease in the given quarter followed by a very large increase in the next quarter in which that model was sold to that customer, or vice versa; (b) it was the first quarter in which the model was sold to the customer and the price experienced a very large increase or decrease in the next quarter in which that model was sold to that customer; or (c) it was the last quarter in which the model was sold to the customer and the price experienced a very large increase or decrease from the previous quarter in which that model was sold to that customer;
(5) The following observations were excluded: (a) observations for which the manufacturer, application, size, model number, or customer name was missing; (b) sales between integrated entities that sold CRTs; and (c) observations identified by Dr. Netz as outliers;
(6) "Large CPTs" refers to CPTs with an actual diagonal size of at least 26 inches. "Small and Medium CPTs" refers to all other CPTs.

Exhibit 5: Dispersion in Quarterly Prices Across All CPT Models and All Customers



Source: Global CRT sales data for Chunghwa, Daewoo, Hitachi, IRICO, LGE, LPD, Mitsubishi, MTPD, Panasonic Corporation, Philips, SDI, Samtel, Thai CRT, Thomson, and Toshiba Corp.

Exhibit 5: Notes for Dispersion in Quarterly Prices Across All CPT Models and All Customers

Notes:
(1) The global CPT sales data range from Q1 1995 to Q4 2007;
(2) A point on the above chart represents the quantity-weighted average price for a given CPT model, customer, and quarter;
(3) Prices were excluded as outliers as follows: for each quarter in which a given CPT model was sold to a given customer, the average quarterly price change was calculated between the given quarter and the previous quarter in which the same model was sold to the same customer. Price changes that were less than the 25th percentile of the distribution of price changes across all defendants minus 3 times the interquartile range of that distribution or greater than the 75th percentile of the distribution plus 3 times the interquartile range were flagged as "very large price decreases" or "very large price increases," respectively. Prices for a given model, customer, and quarter were excluded as outliers if: (a) the price for the model and customer experienced a very large decrease in the given quarter followed by a very large increase in the next quarter in which that model was sold to that customer, or vice versa; (b) it was the first quarter in which the model was sold to the customer and the price experienced a very large increase or decrease in the next quarter in which that model was sold to that customer; or (c) it was the last quarter in which the model was sold to the customer and the price experienced a very large increase or decrease from the previous quarter in which that model was sold to that customer;
(4) The following observations were also excluded: (a) Sales between integrated entities that sold CPTs; and (b) observations identified by Dr. Netz as outliers;
(5) A *de minimis* number of observations are outside the bounds of the y-axis.

Exhibit 6: Share of CPT Units Sales with a Corresponding Alleged Target Price ("Target Price Coverage")

Coverage Using Dr. Netz's Matching Methodology	Maximum Coverage Using Corrected Matching Methodology
29.7%	17.4%

Maximum Coverage for Small and Medium CPTs Using Corrected Matching Methodology	Maximum Coverage for Large CPTs Using Corrected Matching Methodology
22.2%	5.0%

Maximum Coverage for Non-North America CPTs Using Corrected Matching Methodology	Maximum Coverage for North America CPTs Using Corrected Matching Methodology
17.5%	9.9%

Sources:
(1) Global CRT sales data for Chunghwa, Daewoo, Hitachi, IRICO, LGE, LPD, Mitsubishi, MTPD, Panasonic Corporation, Philips, SDI, Samtel, Thai CRT, Thomson, and Toshiba Corp.;
(2) Netz target price data.

Exhibit 6: Notes for Share of CPT Sales with a Corresponding Alleged Target Price ("Target Price Coverage")

Notes:
(1) Coverage using Dr. Netz's matching methodology represents the share of CPTs sold worldwide during the class period for which Dr. Netz identified at least one CPT target price for the same manufacturer, size, finish, and quarter.
(2) The corrected matching methodology differs from Dr. Netz's methodology in that the former matches actual and CPT target prices only if they share the same month (as opposed to quarter) and shape (if it is possible to identify the shape of the CPT sold), and only if the manufacturer attended the relevant meeting or if there is some indication in the meeting minutes that the manufacturer agreed to the target price;
(3) "Large CPTs" refers to CPTs with an actual diagonal size of at least 26 inches. "Small and Medium CPTs" refers to all other CPTs.

Exhibit 7: Changes in Actual Prices vs. Changes in Target Prices (by Model, Factory, Customer, and Quarter)



Sources: (1) Global CRT sales data for Chunghwa, Daewoo, Hitachi, IRICO, LGE, LPD, Mitsubishi, MTPD, Panasonic Corporation, Philips, SDI, Samtel, Thai CRT, Thomson, and Toshiba Corp.; (2) Netz target price data.

Exhibit 7: Notes for Changes in Actual Price vs. Changes in Target Prices (by Model, Factory, Customer, and Quarter)

Notes:
(1) An actual price observation represents the quantity-weighted average actual price for a given model, factory, customer, and quarter using global CPT sales data for Q1 1995 to Q4 2007;
(2) A target price observation represents the average of the CPT target prices identified by Dr. Netz for a given manufacturer, size, and finish (bare/ITC), ("group") and quarter, weighted by the number of days that the target price was effective during that quarter;
(3) Actual and target price changes represent the average quarterly percentage change (divided by 100) in the actual price for a given model, factory, and customer and the average quarterly percentage change (divided by 100) in the target price for the group between quarters *t* and *t-x*, where *x* is defined as the smallest positive integer (possibly equal to 1) for which there were actual prices for the model-factory-customer and target prices for the group in quarters *t* and *t-x*. That is, actual and target price changes were calculated over the same period of time, and x represents the shortest period over which this was possible.
(4) Actual prices were excluded as outliers as follows: For each quarter in which a given CPT model produced in a given factory was sold to a given customer, the average quarter-to-quarter price change was calculated between the given quarter and the previous quarter in which the same model was produced in the same factory and sold to the same customer. Price changes that were less than the 25th percentile of the distribution of price changes across all defendants minus 3 times the interquartile range of that distribution or greater than the 75th percentile of the distribution plus 3 times the interquartile range were flagged as "very large price decreases" or "very large price increases," respectively. Prices for a given model, factory, customer, and quarter were excluded as outliers if: (a) the price for the model, factory, and customer experienced a very large decrease in the given quarter followed by a very large increase in the next quarter in which the same model was produced in the same factory and sold to the same customer, or vice versa; (b) it was the first quarter in which the model was produced at that factory and sold to that customer and the price experienced a very large increase or decrease in the next quarter in which the model was produced at that factory and sold to that customer; or (c) it was the last quarter in which the model was produced in that factory and sold to that customer and the price experienced a very large increase or decrease from the previous quarter in which the model was produced in that factory and sold to that customer;
(5) The following actual price observations were also excluded: (a) observations for which the manufacturer, application, size, finish, model number, customer name, or quarter were missing; (b) sales between integrated entities that sold CRTs; (c) observations with more than four quarters between observed pairs of actual price changes and target price changes.
(6) A *de minimis* number of observations are outside the bounds of the x or y axis.

Exhibit 8: Regressions of Changes in Actual Prices on Changes in Target Prices

Row	Dependent Variable	Independent Variables			Large CPTs	Small and Medium CPTs	Results			Robustness Checks	
	Change in Actual Price (Level of Aggregation)	Change in Alleged Target Price (Level of Aggregation)	Change in Macroeconomic Variables	Change in Negotiated Price Currency-to-USD Exchange Rate Variables			Number of Observations	Estimated Coefficient on Change in Target Price	R-Squared	Range of Estimated Coefficient on the Change in Target Price	R-Squared Range
1	Model, Factory, Customer, Quarter	Manufacturer, Application, Size, Finish, Quarter					6,815	0.211***	0.039	0.197*** - 0.287***	0.038 - 0.045
2	Model, Factory, Customer, Quarter	Manufacturer, Application, Size, Finish, Quarter	X				6,815	0.113***	0.133	0.113** - 0.264***	0.076 - 0.137
3	Model, Factory, Customer, Currency, Quarter	Manufacturer, Application, Size, Finish, Quarter		X			6,474	0.184***	0.134	0.184*** - 0.239***	0.116 - 0.151
4	Model, Factory, Customer, Quarter	Manufacturer, Application, Size, Finish, Quarter			X		1,164	-0.0845	0.002	-0.0845 - 0.493	0.000 - 0.038
5	Model, Customer, Factory, Quarter	Manufacturer, Application, Size, Finish, Quarter				X	5,651	0.221***	0.048	0.201*** - 0.277***	0.042 - 0.048

Sources:
(1) Global CRT sales data for Chunghwa, Daewoo, Hitachi, IRICO, LGE, LPD, Mitsubishi, MTPD, Panasonic Corporation, Philips, SDI, Samtel, Thai CRT, Thomson, and Toshiba Corp.; (2) Netz target price data; (3) OECD StatExtracts Database (OECD unemployment rate and industrial production), Bank of Korea (Korean CRT glass PPI), DisplaySearch (worldwide TV sales by technology), U.S. Federal Reserve (exchange rates).

Exhibit 8: Notes for Regressions of Changes in Actual Price on Changes in Target Price

Notes:
(1) An actual price observation represents the quantity-weighted average actual price for a given model, factory, customer, and quarter (rows 1-2 and 4-5) or for a given model, customer, factory, the currency in which the prices were negotiated ("negotiated currency"), and quarter (row 3) using global CPT sales data for Q1 1995 to Q4 2007;
(2) A target price observation represents the average of the CPT target prices identified by Dr. Netz for a given manufacturer, size, and finish (bare/ITC), ("group") and quarter, weighted by the number of days that the target price was effective during that quarter;
(3) Actual and target price changes represent the average quarterly percentage change (divided by 100) in the actual price for a given model, factory, and customer (and negotiated currency in row 3) and the average quarterly percentage change (divided by a hundred) in the CPT target price for the group between quarters *t* and *t-x*, where *x* is defined as the smallest positive integer (possibly equal to 1) for which there were actual prices for the model-factory-customer (and currency in row 3) and target prices for the group in quarters *t* and *t-x*. That is, the actual and target prices changes were calculated over the same period of time, and *x* represents the shortest period over which this was possible;
(4) Actual prices were excluded as outliers as follows: For each quarter in which a given CPT model produced in a given factory was sold to a given customer, the average quarter-to-quarter price change was calculated between the given quarter and the previous quarter in which the same model was produced in the same factory and sold to the same customer. Price changes that were less than the 25th percentile of the distribution of price changes across all defendants minus 3 times the interquartile range of that distribution or greater than the 75th percentile of the distribution plus 3 times the interquartile range were flagged as “very large price decreases” or “very large price increases,” respectively. Prices for a given model, factory, customer, and quarter were excluded as outliers if: (a) the price for the model, factory, and customer experienced a very large decrease in the given quarter followed by a very large increase in the next quarter in which the same model was produced in the same factory and sold to the same customer, or vice versa; (b) it was the first quarter in which the model was produced at that factory and sold to that customer and the price experienced a very large increase or decrease in the next quarter in which the model was produced at that factory and sold to that customer; or (c) it was the last quarter in which the model was produced in that factory and sold to that customer and the price experienced a very large increase or decrease from the previous quarter in which the model was produced in that factory and sold to that customer;
(5) The following actual price observations were also excluded: (a) observations for which the manufacturer, application, size, finish, model number, customer name, or quarter (or currency for the model presented in row 3) were missing; (b) sales between integrated entities that sold CRTs; and (c) observations with more than four quarters between observed pairs of actual price changes and target price changes.

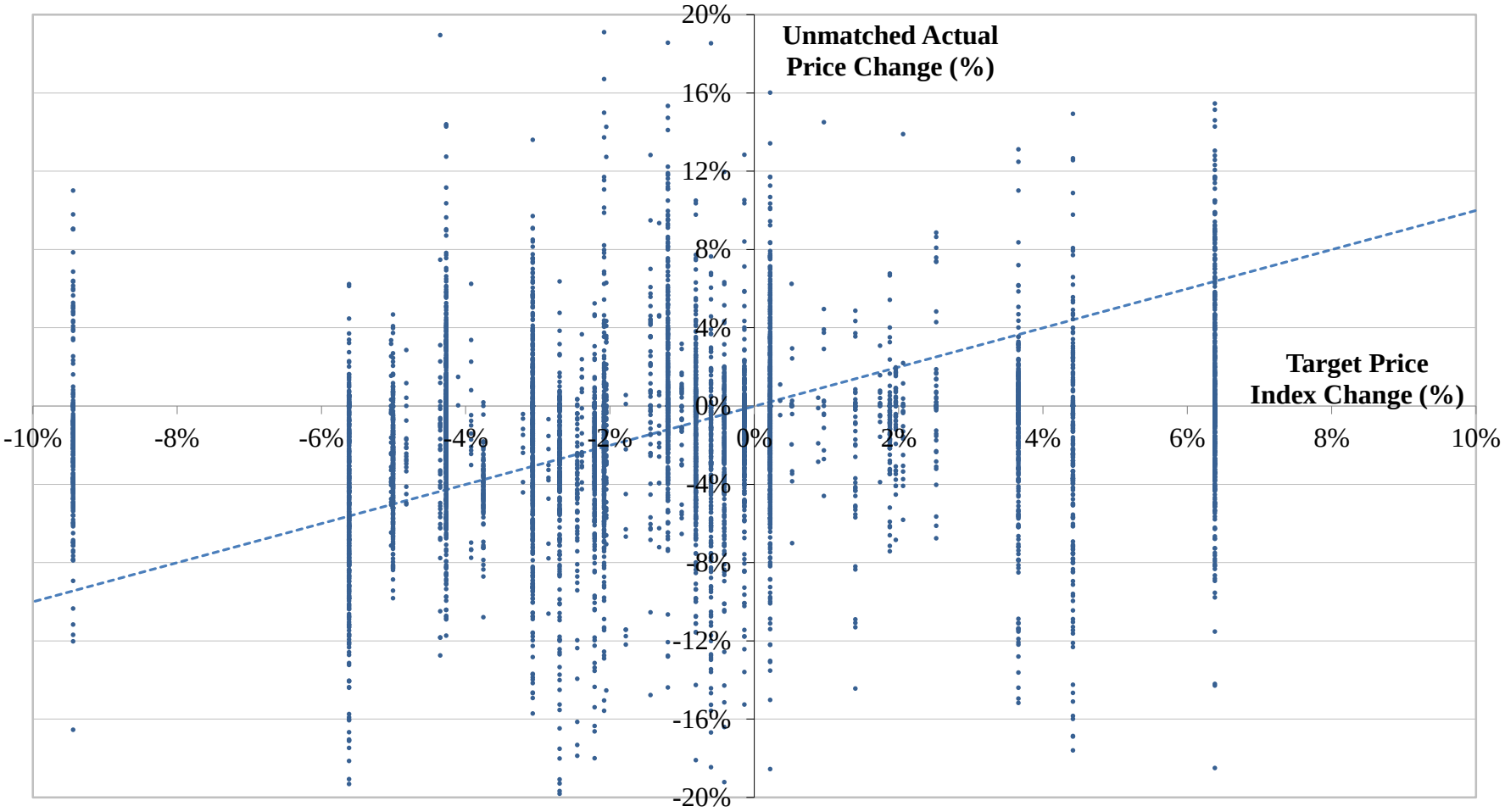
* *Notes continued on next page.*

Exhibit 8: Notes (Continued) for Regressions of Changes in Actual Price on Changes in Target Price

Notes (continued):
(6) The macroeconomic variables included in the model presented in row 2 are: (a) the unemployment rate and industrial production for Organization for Economic Co-operation and Development ("OECD") countries; (b) the Korean CRT glass producer price index ("PPI"); and (c) the quarterly LCD share of worldwide TV revenue. The changes in the Korean glass PPI and the OECD industrial production represents the average quarterly percentage change (divided by a hundred) in that variable between quarters *t* and *t-x*, where *t* and *x* are defined according to Note #3 above. The changes in the OECD unemployment rate and LCD market share represent the average quarterly percentage point change in that variable between quarters *t* and *t-x*;
(7) The exchange rate used in row 3 represents the ratio for quarter *t* between the average price in the negotiated currency and the U.S. dollar average price (both weighted by sales volume) for a given model, factory, customer, and negotiated currency. The change in the exchange rate represents the percentage change (divided by a hundred) in the exchange rate between quarters *t* and *t-x*, where *t* and *x* are defined according to Note #3 above. The model presented in row 3 includes the change in the exchange rate and interactions between this variable and a series of eight "dummy" variables that take the value 1 if the currency in which the actual price was negotiated is the Deutsche Mark, Euro, Japanese Yen, South Korean Won, Malaysian Ringgit, Chinese Yuan, Taiwan New Dollar, or U.S. Dollar respectively, and zero otherwise. To avoid collinearity there is no dummy variable that equals 1 for prices negotiated in Brazil Real;
(8) "Large CPTs" refers to CPTs with an actual diagonal size of at least 26 inches. "Small and Medium CPTs" refers to all other CPTs.
(9) I performed the following robustness checks on each of the regressions presented in the above table:
- weighting observations by sales volume;
- aggregating actual prices by group and quarter (or by group, currency, and quarter in the model presented in row 3);
- using clustered standard errors by group;

The range of results from these robustness checks are reported in the table;
(10) (***) indicates that the estimated coefficient is different from zero at the 0.1% significance level.

Exhibit 9: Changes in Actual Prices of Non-Targeted CPTs vs. Changes in Target Price Index (by Model, Factory, Customer, and Quarter)



Sources: (1) Global CRT sales data for Chunghwa, Daewoo, Hitachi, IRICO, LGE, LPD, Mitsubishi, MTPD, Panasonic Corporation, Philips, SDI, Samtel, Thai CRT, Thomson, and Toshiba Corp.; (2) Netz target price data.

Exhibit 9: Changes in Actual Prices of Non-targeted CPTs vs. Changes in Target Price Index (by Model, Customer, Factory, and Quarter)

Notes:
(1) An actual price observation represents the quantity-weighted average actual price for a given model, factory, customer, and quarter using global CPT sales data for Q1 1995 to Q4 2007;
(2) A target price observation represents the average of the CPT target prices identified by Dr. Netz for a given manufacturer, size, and finish (bare/ITC), ("group") and quarter, weighted by the number of days that the target price was effective during that quarter. Dr. Netz constructs a Fisher target price index using the average quarterly CPT target prices for each group.
(3) Actual and target price index changes represent the average quarterly percentage change (divided by 100) in the actual price for a given model, customer, and factory and the average quarterly percentage change (divided by 100) in the target price index between quarters *t* and *t-x*, where *x* is defined as the smallest positive integer (possibly equal to 1) for which there were actual prices for the model-factory-customer and target price index values in quarters *t* and *t-x*. That is, actual and target price index changes were calculated over the same period of time, and x represents the shortest period over which this was possible.
(4) Actual prices were excluded as outliers as follows: For each quarter in which a given CPT model produced in a given factory was sold to a given customer, the average quarter-to-quarter price change was calculated between the given quarter and the previous quarter in which the same model was produced in the same factory and sold to the same customer. Price changes that were less than the 25th percentile of the distribution of price changes across all defendants minus 3 times the interquartile range of that distribution or greater than the 75th percentile of the distribution plus 3 times the interquartile range were flagged as "very large price decreases" or "very large price increases," respectively. Prices for a given model, factory, customer, and quarter were excluded as outliers if: (a) the price for the model, factory, and customer experienced a very large decrease in the given quarter followed by a very large increase in the next quarter in which the same model was produced in the same factory and sold to the same customer, or vice versa; (b) it was the first quarter in which the model was produced at that factory and sold to that customer and the price experienced a very large increase or decrease in the next quarter in which the model was produced at that factory and sold to that customer; or (c) it was the last quarter in which the model was produced in that factory and sold to that customer and the price experienced a very large increase or decrease from the previous quarter in which the model was produced in that factory and sold to that customer;
(5) The following actual price observations were also excluded: (a) observations for which the manufacturer, application, size, finish, model number, customer name, or quarter were missing; (b) sales between integrated entities that sold CRTs; (c) observations with more than four quarters between observed pairs of actual price changes and target price index changes.
(6) A *de minimis* number of observations are outside the bounds of the x or y axis.

Exhibit 10: Target Prices Are Poor Predictors of Actual Prices of Targeted CPTs

Dependent Variable	Independent Variables	Number of Observations	Probability of Errors Greater than X% when Predicting Actual CPT Prices Based on Target Prices		
			X=5%	X=10%	X=15%
Actual Price of Targeted CPTs	Target Price	8,052	86.0%	71.5%	56.4%

Sources: (1) Global CRT sales data for Chunghwa, Daewoo, Hitachi, IRICO, LGE, LPD, Mitsubishi, MTPD, Panasonic Corporation, Philips, SDI, Samtel, Thai CRT, Thomson, and Toshiba Corp.; (2) Netz target price data.

Exhibit 10: Notes for Target Prices Are Poor Predictors of Actual CPT Prices of Targeted CPTs

Notes:
(1) The model presented is based on the same data that Dr. Netz used in the model presented in Exhibit 38 of her report. Specifically, an actual price observation represents the natural logarithm of the quantity-weighted average actual price for a given model, factory, customer, and quarter using global CPT sales data for Q1 1995 to Q4 2007, and a target price observation represents the natural logarithm of the average of the CPT target prices identified by Dr. Netz for the corresponding manufacturer, size, finish (bare/ITC), and quarter, weighted by the number of days that the target price was effective during that quarter;
(2) The reported probabilities that the predicted actual prices would be greater than X% are statistically significant at the 95% confidence level. Specifically, they are based on the 5% lower bound on the variance of the prediction errors.

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Exhibit 11: Target Prices Are Poor Predictors of Actual Prices of Non-Targeted CPTs

Dependent Variable	Independent Variables	Observations (N)	Probability of Errors Greater than X% when Predicting Actual CPT Prices Based on Target Prices		
			X=5%	X=10%	X=15%
Actual Price of Non-Targeted CPTs	Target Price Index	10,915	95.3%	90.6%	85.9%

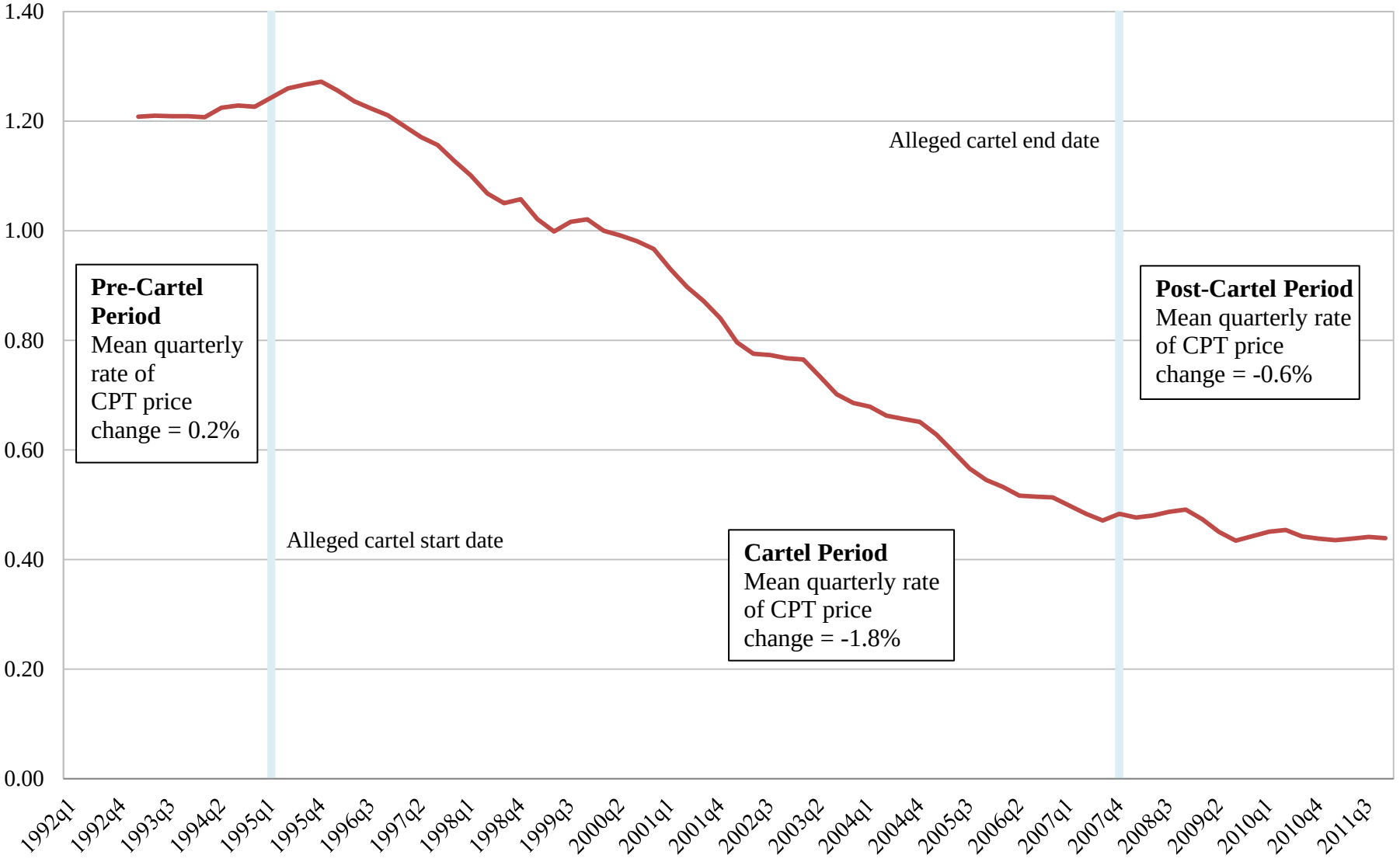
Sources: (1) Global CRT sales data for Chunghwa, Daewoo, Hitachi, IRICO, LGE, LPD, Mitsubishi, MTPD, Panasonic Corporation, Philips, SDI, Samtel, Thai CRT, Thomson, and Toshiba Corp.; (2) Netz target price data.

Exhibit 11: Notes for Target Prices Are Poor Predictors of Actual Prices of Non-Targeted CPTs

Notes:
(1) The model presented is based on the data that Dr. Netz used in the model presented in Exhibit 45 of her report and is limited to actual price observations for which there is no corresponding target price. Specifically, an actual price observation represents the natural logarithm of the quantity-weighted average actual prices for a given model, customer, factory, and quarter using global CPT sales data for Q1 1995 to Q4 2007, and a target price observation represents the natural logarithm of the Fisher price index Dr. Netz constructed (which she refers to as a "target price index") using the average of the CPT target prices she identified for by manufacturer, size, finish (bare/ITC), and quarter, weighted by the number of days that the target price was effective during that quarter;
(2) The reported probabilities that the predicted actual prices would be greater than X% are statistically significant at the 95% confidence level. Specifically, they are based on the 5% lower bound on the variance of the prediction errors.

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Exhibit 12: Fisher Index of Global CPT Prices



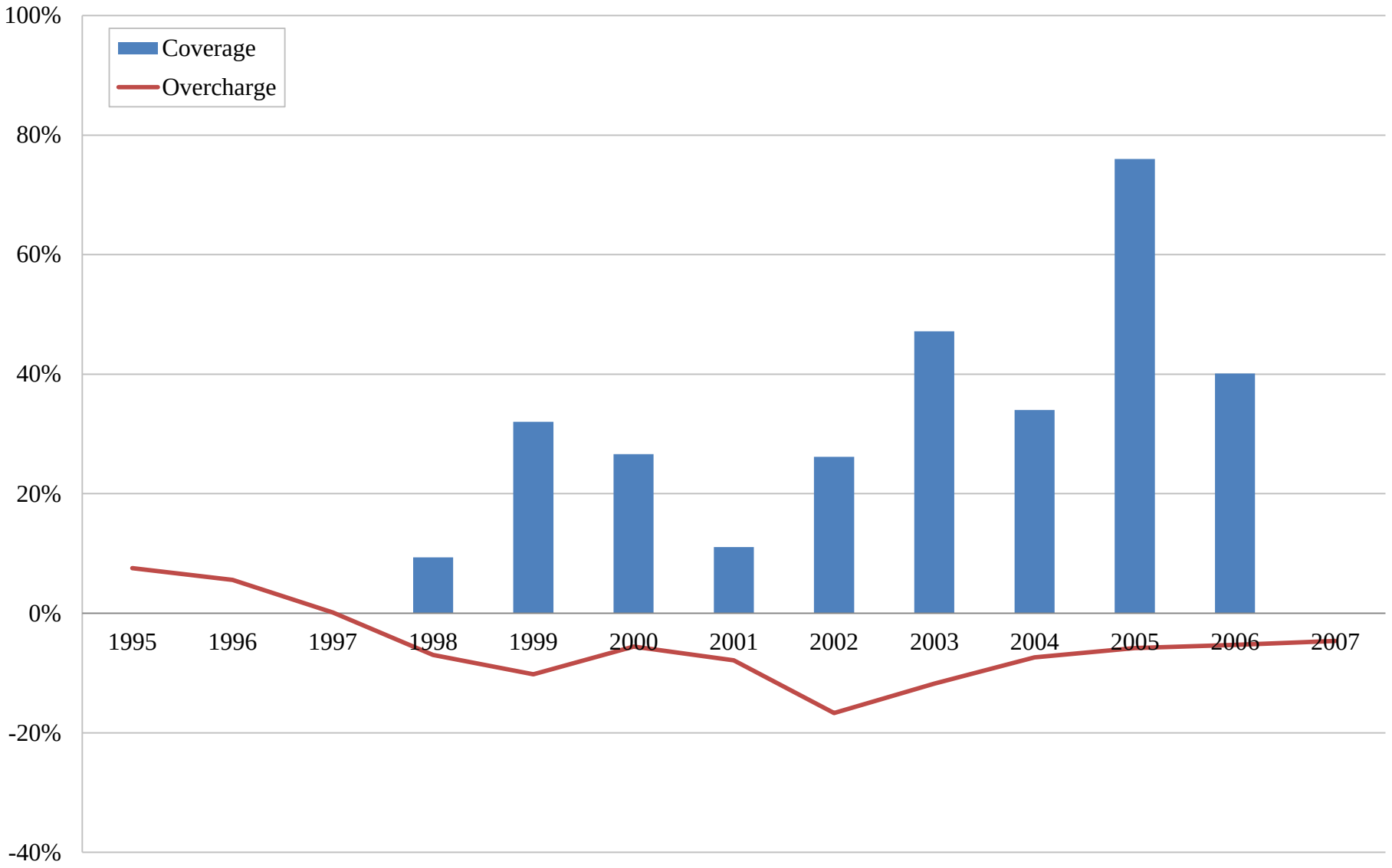
Source: Global CRT sales data for Chunghwa, Daewoo, Hitachi, IRICO, LGE, LPD, Mitsubishi, MTPD, Panasonic Corporation, Philips, SDI, Samtel, Thai CRT, Thomson, and Toshiba Corp.

Exhibit 12: Notes for Fisher Index of Global CPT Prices

Notes:
(1) The global CRT sales data range from Q1 1992 to Q4 2011;
(2) The quarter-to-quarter change in the Fisher Price Index represents an average across all CPT models and customers of the changes in the prices paid by each customer for each model; the price changes across quarters one and two are averaged in two ways - once using the quarter one sales volumes and once using the quarter two sales volumes - and the change in the Fisher Price Index represents the geometric mean of the two average price changes;
(3) Each index is set to 1.0 in Q1 2000;
(4) Prices were excluded as outliers as follows: for each quarter in which a given CPT model was sold to a given customer, the average quarterly price change was calculated between the given quarter and the previous quarter in which the same model was sold to the same customer. Price changes that were less than the 25th percentile of the distribution of price changes across all defendants minus 3 times the interquartile range of that distribution or greater than the 75th percentile of the distribution plus 3 times the interquartile range were flagged as "very large price decreases" or "very large price increases," respectively. Prices for a given model, customer, and quarter were excluded as outliers if: (a) the price for the model and customer experienced a very large decrease in the given quarter followed by a very large increase in the next quarter in which that model was sold to that customer, or vice versa; (b) it was the first quarter in which the model was sold to the customer and the price experienced a very large increase or decrease in the next quarter in which that model was sold to that customer; or (c) it was the last quarter in which the model was sold to the customer and the price experienced a very large increase or decrease from the previous quarter in which that model was sold to that customer;
(5) The following observations were excluded: (a) observations for which the model number or customer name was missing; (b) sales between integrated entities that sold CPTs; and (c) observations identified by Dr. Netz as outliers.

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Exhibit 13: CPT Target Price Coverage and Overcharge Percentages (1995-2007)



Sources: (1) Global CRT sales data for Chunghwa, Daewoo, Hitachi, IRICO, LGE, LPD, Mitsubishi, MTPD, Panasonic Corporation, Philips Samtel, Thai CRT, Thomson, and Toshiba Corp.; (2) Netz Target Price Data.

Exhibit 13: Notes for CPT Target Price Coverage and Overcharge Percentages (1995-2007)

Notes:
(1) The overcharge percentage for each year was estimated using Dr. Netz's overcharge regression model (Netz Damages Report, pp. 103-105), except that the single cartel-indicator variable for the entire class period was replaced with a year indicator variable for each year of the class period (the indicator variable for 1995 was set equal to 0 in Q1 1995 and 1 in Q2-Q4 1995).
(2) The annual overcharge expressed as a percentage of actual CPT prices was calculated using the same methodology as described in the Netz Damages Report Errata (p. 1). Specifically, b_t, the estimated coefficient on the year t indicator variable was first converted into a percentage of but-for CPT prices using the formula: $OC_{BF} = \exp[b_t - Var(b_t)/2]$, where $Var(b_t)$ is the estimated variance of b_t . $OC_{BF,t}$ was then converted into a percentage of actual prices using the formula: $OC_{A,t} = 1 / (1 + OC_{BF,t})$.
(3) The target price coverage was measured using Dr. Netz's matching methodology and represents the share of CPTs sold worldwide during the class period for which Dr. Netz identified at least one CPT target price for the same manufacturer, size, finish, and quarter.

ATTACHMENT 1

August 2014

Curriculum Vitae

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Education:

Ph.D. Economics, Stanford University, 1973
Dissertation: Welfare Analysis of Policies Affecting Prices and Products.
Advisor: James Rosse

M.S. Operations Research, Stanford University, 1968.

A.B. Mathematics, Harvard University, 1967.

Professional Positions:

Professor of Economics and Public Affairs, Princeton University, 1978-.

Principal External Advisor, Infrastructure Program, Inter-American Development Bank, 6/97-8/98.

Deputy Assistant Attorney General, U.S. Department of Justice, l989-1991.

Supervisor, Economics Research Department, Bell Laboratories, 1977-1978.

Visiting Lecturer (with rank of Associate Professor), Department of Economics and Woodrow Wilson School, Princeton University, 1977-78 (part time).

Economics Research Department, Bell Laboratories, 1973-77.

Lecturer, Economics Department, Stanford University, 1971-73.

Other Professional Activities

ABA Section of Antitrust Law Economics Task Force, 2010-2012

Advisory Committee, Compass Lexecon 2010 -

OECD Advisory Council for Mexican Economic Reform, 2008 - 2009

Senior Consultant, Compass Lexecon, 2008 -

Director, Competition Policy Associates, Inc., 2003-2005

Advisory Bd., Electronic Journal of I.O. and Regulation Abstracts, 1996-2008.

Advisory Board, Journal of Network Industries, 2004-2010.

Visiting Faculty Member (occasional), International Program on Privatization and Regulatory Reform, Harvard Institute for International Development, 1996-2000.

Member, National Research Council Highway Cost Allocation Study
Review Committee, 1995-98.

Member, Defense Science Board Task Force on the Antitrust Aspects of Defense Industry Consolidation, 1993-94.

Editorial Board, Utilities Policy, 1990-2001.

Leif Johanson Lecturer, University of Oslo, November 1988.

Member, New Jersey Governor's Task Force on Market-Based Pricing of Electricity, 1987-89.

Co-editor, Handbook of Industrial Organization, 1984-89.

Associate Editor, Journal of Industrial Economics, 1984-89.

Director, Consultants in Industry Economics, Inc., 1983-89, 1991-94.

Fellow, Econometric Society, 1981-.

Organizing Committee, Carnegie-Mellon-N.S.F. Conference on Regulation, 1985.

Board of Editors, American Economic Review, 1980-83.

Nominating Committee, American Economic Association, 1980-1981.

Research Advisory Committee, American Enterprise Institute, 1980-1986.

Editorial Board, M.I.T. Press Series on Government Regulation of Economic Activity, 1979-93.

Program Committee, 1980 World Congress of the Econometric Society.

Program Committee, Econometric Society, 1979, 1981, 1985.

Organizer, American Economic Association Meetings: 1980, 1982.

American Bar Association Section 7 Clayton Act Committee, 198l.

Principal Investigator, NSF grant SOC79-0327, 1979-80; NSF grant 285-6041, 1980-82; NSF grant SES-8038866, 1983-84, 1985-86.

Aspen Task Force on the Future of the Postal Service, 1978-80.

Organizing Committee of Sixth Annual Telecommunications Policy Research Conference, 1977-78.

Visiting Fellow, University of Warwick, July 1977.

Institute for Mathematical Studies in the Social Sciences, Stanford University, 1975.

Published Articles and Book Chapters:

"Unilateral Competitive Effects" (with Bryan Keating), in The Oxford Handbook on International Antitrust Economics, (Roger D. Blair and D. Daniel Sokol, eds.), Oxford University Press, forthcoming 2014.

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Unpublished Papers and Reports:

"Commentary on Economics at the FTC: Hospital Mergers, Authorized Generic Drugs, and Consumer Credit Markets" (with Nauman Ilias, Bryan Keating, and Paolo Ramezzana), under revision for Review of Industrial Organization**.**

"Recommendations for Excessive-Share Limits in the Surfclam and Ocean Quahog Fisheries" (with Glenn Mitchell and Steven Peterson), Report to National Marine Fisheries Service and the Mid-Atlantic Fishery Management Council, 5/23/2011.

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"An Econometric Analysis of the Matching Between Football Student-Athletes and Colleges," (with Yair Eilat, Bryan Keating and Jon Orszag), submitted for publication.

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"Assessment of U.S. Merger Enforcement Policy," statement before the Antitrust Modernization Commission, 11/17/05.

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"Stimulating Investment and the Telecommunications Act of 1996," (with J. Bigelow, W. Lehr and S. Levinson), 2002.

"An Economic Analysis of Spectrum Allocation and Advanced Wireless Services," (with Martin N. Baily, Peter R. Orszag, and Jonathan M. Orszag), 2002

"Effective Deregulation of Residential Electric Service," 2001

"Anticompetitive Forced Rail Access" (with W. J. Baumol), 2000

“The Scope of Competition in Telecommunications” (with B. Douglas Bernheim), 1998 “Why

Do Christie and Schultz Infer Collusion From Their Data? (with Alan Kleidon), 1995.

"Demonopolization," (with Sally Van Siclen), OECD Vienna Seminar Paper, 1993.

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"The Economics of Equipment Leasing: Costing and Pricing," 1980.

"Rail Deregulation and the Financial Problems of the U.S. Railroad Industry," (with W.J. Baumol), report prepared under contract to Conrail, 1979.

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Invited Conference Presentations:

Brookings Institution Conference on The Economics of the Airline Industry
"Airline Network Effects and Consumer Welfare" 2012

AGEP Public Policy Conference on Pharmaceutical Industry Economics, Regulation and Legal Issues; Law and Economics Center, George Mason University School of Law
"Pharmaceutical Brand-Generic Disputes" 2012

U.S.-EU Alliance Study Peer Review Conferences
"Review of Cooperative Agreements in Transatlantic Airline Markets" 2012
"The Research Agenda Ahead" 2012

Antitrust in the High Tech Sector Conference
"Developments in Merger Enforcement" 2012

Georgetown Center for Business and Public Policy, Conference on the Evolution of Regulation
"Reflections on Regulation" 2011

Antitrust Forum, New York State Bar Association
"Upward Price Pressure, Market Definition and Supply Mobility" 2011

American Bar Association, Antitrust Section, Annual Convention
"The New Merger Guidelines' Analytic Highlights" 2011

OECD and World Bank Conference on Challenges and Policies for Promoting Inclusive Growth
"Inclusive Growth From Competition and Innovation" 2011

Villanova School of Business Executive MBA Conference
"Airline Network Effects, Competition and Consumer Welfare" 2011

NYU School of Law Conference on Critical Directions in Antitrust
"Unilateral Competitive Effects" 2010

Conf. on the State of European Competition Law and Enforcement in a Transatlantic Context
"Recent Developments in Merger Control" 2010

Center on Regulation and Competition, Universidad de Chile Law School
"Economic Regulation and the Limits of Antitrust Law" 2010

Center on Regulation and Competition, Universidad de Chile Law School
"Merger Policy and Guidelines Revision" 2010

Faculty of Economics, Universidad de Chile
"Network Effects in Airlines Markets" 2010

Georgetown Law Global Antitrust Enforcement Symposium
"New US Merger Guidelines" 2010

FTI London Financial Services Conference
"Competition and Regulatory Reform" 2010

NY State Bar Association Annual Antitrust Conference
"New Media Competition Policy" 2009

Antitrust Law Spring Meeting of the ABA
"Antitrust and the Failing Economy Defense" 2009

Georgetown Law Global Antitrust Enforcement Symposium
"Mergers: New Enforcement Attitudes in a Time of Economic Challenge" 2009

Phoenix Center US Telecoms Symposium
"Assessment of Competition in the Wireless Industry" 2009

FTC and DOJ Horizontal Merger Guidelines Workshop
"Direct Evidence is No Magic Bullet" 2009

Northwestern Law Research Symposium: Antitrust Economics and Competition Policy
"Discussion of Antitrust Evaluation of Horizontal Mergers" 2008

Inside Counsel Super-Conference
"Navigating Mixed Signals under Section 2 of the Sherman Act" 2008

Federal Trade Commission Workshop on Unilateral Effects in Mergers
"Best Evidence and Market Definition" 2008

European Policy Forum, Rules for Growth: Telecommunications Regulatory Reform
"What Kind of Regulation For Business Services?" 2007

Japanese Competition Policy Research Center, Symposium on M&A and Competition Policy
"Merger Policy Going Forward With Economics and the Economy" 2007

Federal Trade Commission and Department of Justice Section 2 Hearings
"Section 2 Policy and Economic Analytic Methodologies" 2007

Pennsylvania Bar Institute, Antitrust Law Committee CLE
"The Economics of Resale Price Maintenance and Class Certification" 2007

Pennsylvania Bar Institute, Antitrust Law Committee CLE
"Antitrust Class Certification – An Economist's Perspective" 2007

Fordham Competition Law Institute, International Competition Economics Training Seminar
"Monopolization and Abuse of Dominance" 2007

Canadian Bar Association Annual Fall Conference on Competition Law
"Economic Tools for the Competition Lawyer" 2007

Conference on Managing Litigation and Business Risk in Multi-jurisdiction Antitrust Matters
"Economic Analysis in Multi-jurisdictional Merger Control" 2007

World Bank Conference on Structuring Regulatory Frameworks for Dynamic and Competitive South Eastern European Markets
"The Roles of Government Regulation in a Dynamic Economy" 2006

Department of Justice/Federal Trade Commission Section 2 Hearings
"(Allegedly) Monopolizing Tying Via Product Innovation" 2006

Fordham Competition Law Institute, Competition Law Seminar
"Monopolization and Abuse of Dominance" 2006

Practicing Law Institute on Intellectual Property Antitrust
"Relevant Markets for Intellectual Property Antitrust" 2006

PLI Annual Antitrust Law Institute
"Cutting Edge Issues in Economics" 2006

World Bank's Knowledge Economy Forum V
"Innovation, Growth and Competition" 2006

Charles University Seminar Series
"The Dangers of Over-Ambitious Antitrust Regulation" 2006

NY State Bar Association Antitrust Law Section Annual Meeting
"Efficient Integration or Illegal Monopolization?" 2006

World Bank Seminar
"The Dangers of Over-Ambitious Regulation" 2005

ABA Section of Antitrust Law 2005 Fall Forum
"Is There a Gap Between the Guidelines and Agency Practice?" 2005

Hearing of Antitrust Modernization Commission
"Assessment of U.S. Merger Enforcement Policy" 2005

LEAR Conference on Advances in the Economics of Competition Law
"Exclusionary Pricing Practices" 2005

Annual Antitrust Law Institute
"Cutting Edge Issues in Economics" 2005

PRIOR Symposium on States and Stem Cells
"Assessing the Economics of State Stem Cell Programs" 2005

ABA Section of Antitrust Law – AALS Scholars Showcase
"Distinguishing Anticompetitive Conduct" 2005

Allied Social Science Associations National Convention
"Antitrust in the New Economy" 2005

ABA Section of Antitrust Law 2004 Fall Forum
"Advances in Economic Analysis of Antitrust" 2004

Phoenix Center State Regulator Retreat
"Regulatory Policy for the Telecommunications Revolution" 2004

OECD Competition Committee
"Use of Economic Evidence in Merger Control" 2004

Justice Department/Federal Trade Commission Joint Workshop
"Merger Enforcement" 2004

Phoenix Center Annual U.S. Telecoms Symposium
"Incumbent Market Power" 2003

Center for Economic Policy Studies Symposium on Troubled Industries
"What Role for Government in Telecommunications?" 2003

Princeton Workshop on Price Risk and the Future of the Electric Markets
"The Structure of the Electricity Markets" 2003

2003 Antitrust Conference
"International Competition Policy and Trade Policy" 2003

International Industrial Organization Conference
"Intellectual Property System Reform" 2003

ABA Section of Antitrust Law 2002 Fall Forum
"Competition, Regulation and Pharmaceuticals" 2002

Fordham Conference on International Antitrust Law and Policy
"Substantive Standards for Mergers and the Role of Efficiencies" 2002

Department of Justice Telecom Workshop
"Stimulating Investment and the Telecommunications Act of 1996" 2002

Department of Commerce Conference on the State of the Telecom Sector
"Stimulating Investment and the Telecommunications Act of 1996" 2002

Law and Public Affairs Conference on the Future of Internet Regulation
"Open Access and Competition Policy Principles" 2002

Center for Economic Policy Studies Symposium on Energy Policy
"The Future of Power Supply" 2002

The Conference Board: Antitrust Issues in Today's Economy
"The 1982 Merger Guidelines at 20" 2002

Federal Energy Regulatory Commission Workshop
"Effective Deregulation of Residential Electric Service" 2001

IPEA International Seminar on Regulation and Competition
"Electricity Markets: Deregulation of Residential Service" 2001
"Lessons for Brazil from Abroad" 2001

ABA Antitrust Law Section Task Force Conference
"Time, Change, and Materiality for Monopolization Analyses" 2001

Harvard University Conference on American Economic Policy in the 1990s
"Comments on Antitrust Policy in the Clinton Administration" 2001

Tel-Aviv Workshop on Industrial Organization and Anti-Trust
"The Risk of Contagion from Multimarket Contact" 2001

2001 Antitrust Conference
"Collusion Cases: Cutting Edge or Over the Edge?" 2001
"Dys-regulation of California Electricity" 2001

FTC Public Workshop on Competition Policy for E-Commerce
"Necessary Conditions for Cooperation to be Problematic" 2001

HIID International Workshop on Infrastructure Policy
"Infrastructure Privatization and Regulation" 2000

Villa Mondragone International Economic Seminar
"Competition Policy for Network and Internet Markets" 2000

New Developments in Railroad Economics: Infrastructure Investment and Access Policies
"Railroad Access, Regulation, and Market Structure" 2000

The Multilateral Trading System at the Millennium
"Efficiency Gains From Further Liberalization" 2000

Singapore – World Bank Symposium on Competition Law and Policy
"Policy Towards Cartels and Collusion" 2000

CEPS: Is It a New World?: Economic Surprises of the Last Decade
"The Internet and E-Commerce" 2000

Cutting Edge Antitrust: Issues and Enforcement Policies
"The Direction of Antitrust Entering the New Millennium" 2000

The Conference Board: Antitrust Issues in Today's Economy
"Antitrust Analysis of Industries With Network Effects" 1999

CEPS: New Directions in Antitrust
"Antitrust in a High-Tech World" 1999

World Bank Meeting on Competition and Regulatory Policies for Development
"Economic Principles to Guide Post-Privatization Governance" 1999

1999 Antitrust Conference
"Antitrust and the Pace of Technological Development" 1999
"Restructuring the Electric Utility Industry" 1999

HIID International Workshop on Privatization, Regulatory Reform and Corporate Governance
"Privatization and Post-Privatization Regulation of Natural Monopolies" 1999

The Federalist Society: Telecommunications Deregulation: Promises Made, Potential Lost?
"Grading the Regulators" 1999

Inter-American Development Bank: Second Generation Issues In the Reform Of Public Services
"Post-Privatization Governance" 1999
"Issues Surrounding Access Arrangements" 1999

Economic Development Institute of the World Bank -- Program on Competition Policy
"Policy Towards Horizontal Mergers" 1998

Twenty-fifth Anniversary Seminar for the Economic Analysis Group of the Department of

Justice
"Market Definition in Antitrust Analysis" 1998

HIID International Workshop on Privatization, Regulatory Reform and Corporate Governance
"Infrastructure Architecture and Regulation: Railroads" 1998

EU Committee Competition Conference – Market Power
"US/EC Perspective on Market Definition" 1998

Federal Trade Commission Roundtable
"Antitrust Policy for Joint Ventures" 1998

1998 Antitrust Conference
"Communications Mergers" 1998

The Progress and Freedom Foundation Conference on Competition, Convergence, and the Microsoft Monopoly
Access and Bundling in High-Technology Markets 1998

FTC Program on The Effective Integration of Economic Analysis into Antitrust Litigation
The Role of Economic Evidence and Testimony 1997

FTC Hearings on Classical Market Power in Joint Ventures
Microeconomic Analysis and Guideline 1997

World Bank Economists --Week IV Keynote
Making Markets More Effective With Competition Policy 1997

Brookings Trade Policy Forum
Competition Policy and Antidumping: The Economic Effects 1997

University of Malaya and Harvard University Conference on The Impact of Globalisation and Privatisation on Malaysia and Asia in the Year 2020
Microeconomics, Privatization, and Vertical Integration 1997

ABA Section of Antitrust Law Conference on The Telecommunications Industry
Current Economic Issues in Telecommunications 1997

Antitrust 1998: The Annual Briefing
The Re-Emergence of Distribution Issues 1997

Inter-American Development Bank Conference on Private Investment, Infrastructure Reform and Governance in Latin America & the Caribbean
Economic Principles to Guide Post-Privatization Governance 1997

Harvard Forum on Regulatory Reform and Privatization of Telecommunications in the Middle East
Privatization: Methods and Pricing Issues 1997

American Enterprise Institute for Public Policy Research Conference
Discussion of Local Competition and Legal Culture 1997

Harvard Program on Global Reform and Privatization of Public Enterprises
"Infrastructure Privatization and Regulation: Freight" 1997

World Bank Competition Policy Workshop
"Competition Policy for Entrepreneurship and Growth" 1997

Eastern Economics Association Paul Samuelson Lecture
"Bottleneck Access in Regulation and Competition Policy" 1997

ABA Annual Meeting, Section of Antitrust Law
"Antitrust in the 21st Century: The Efficiencies Guidelines" 1997

Peruvian Ministry of Energy and Mines Conference on Regulation of Public Utilities
"Regulation: Theoretical Context and Advantages vs. Disadvantages" 1997

The FCC: New Priorities and Future Directions
"Competition in the Telecommunications Industry" 1997

American Enterprise Institute Studies in Telecommunications Deregulation
"The Scope of Competition in Telecommunications" 1996

George Mason Law Review Symposium on Antitrust in the Information Revolution
"Introduction to the Economic Theory of Antitrust and Information" 1996

Korean Telecommunications Public Lecture
"Market Opening and Fair Competition" 1996

Korea Telecommunications Forum
"Desirable Interconnection Policy in a Competitive Market" 1996

European Association for Research in Industrial Economics Annual Conference
"Bottleneck Access: Regulation and Competition Policy" 1996

Harvard Program on Global Reform and Privatization of Public Enterprises
"Railroad and Other Infrastructure Privatization" 1996

FCC Forum on Antitrust and Economic Issues Involved with InterLATA Entry
"The Scope of Telecommunications Competition" 1996

Citizens for a Sound Economy Policy Watch on Telecommunications Interconnection
"The Economics of Interconnection" 1996

World Bank Seminar on Experiences with Corporatization
"Strategic Directions of Privatization" 1996

FCC Economic Forum on the Economics of Interconnection
Lessons from Other Industries 1996

ABA Annual Meeting, Section of Antitrust Law
The Integration, Disintegration, and Reintegration
of the Entertainment Industry 1996

Conference Board: 1996 Antitrust Conference
How Economics Influences Antitrust and Vice Versa 1996

Antitrust 1996: A Special Briefing
Joint Ventures and Strategic Alliances 1996

New York State Bar Association Section of Antitrust Law Winter Meeting
Commentary on Horizontal Effects Issues 1996

FTC Hearings on the Changing Nature of Competition in a Global and Innovation-Driven Age
Vertical Issues for Networks and Standards 1995

Wharton Seminar on Applied Microeconomics
Access Policies with Imperfect Regulation 1995

Antitrust 1996, Washington D.C.
Assessing Joint Ventures for Diminution of Competition 1995

ABA Annual Meeting, Section of Antitrust Law
Refusals to Deal -- Economic Tests for Competitive Harm 1995

FTC Seminar on Antitrust Enforcement Analysis
Diagnosing Collusion Possibilities 1995

Philadelphia Bar Education Center: Antitrust Fundamentals
Antitrust--The Underlying Economics 1995

Vanderbilt University Conference on Financial Markets

Why Do Christie and Schultz Infer Collusion From Their Data? 1995

ABA Section of Antitrust Law Chair=s Showcase Program
Discussion of Telecommunications Competition Policy 1995

Conference Board: 1995 Antitrust Conference
Analysis of Mergers and Joint Ventures 1995

ABA Conference on The New Antitrust: Policy of the '90s
Antitrust on the Super Highways/Super Airways 1994

ITC Hearings on The Economic Effects of Outstanding Title VII Orders
"The Economic Impacts of Antidumping Policies" 1994

OECD Working Conference on Trade and Competition Policy
"Empirical Evidence on The Nature of Anti-dumping Actions" 1994

Antitrust 1995, Washington D.C.
"Rigorous Antitrust Standards for Distribution Arrangements" 1994

ABA -- Georgetown Law Center: Post Chicago-Economics: New Theories - New Cases?
"Economic Foundations for Vertical Merger Guidelines" 1994

Conference Board: Antitrust Issues in Today's Economy
"New Democrats, Old Agencies: Competition Law and Policy" 1994

Federal Reserve Board Distinguished Economist Series
"Regulated Private Enterprise Versus Public Enterprise" 1994

Institut d'Etudes Politiques de Paris
"Lectures on Competition Policy and Privatization" 1993

Canadian Bureau of Competition Policy Academic Seminar Series, Toronto.
"Public Versus Regulated Private Enterprise" 1993

CEPS Symposium on The Clinton Administration: A Preliminary Report Card
"Policy Towards Business" 1993

Columbia Institute for Tele-Information Conference on Competition in Network Industries, New York, NY
"Discussion of Deregulation of Networks: What Has Worked and What Hasn't" 1993

World Bank Annual Conference on Development Economics
"Public Versus Regulated Private Enterprise" 1993

Center for Public Utilities Conference on Current Issues Challenging the Regulatory Process
"The Economics of Current Issues in Telecommunications Regulation" 1992
"The Role of Markets in Presently Regulated Industries" 1992

The Conference Board's Conference on Antitrust Issues in Today's Economy, New York, NY
"Antitrust in the Global Economy" 1992
"Monopoly Issues for the '90s" 1993

Columbia University Seminar on Applied Economic Theory, New York, NY
"Economic Rationales for the Scope of Privatization" 1992

Howrey & Simon Conference on Antitrust Developments, Washington, DC
"Competitive Effects of Concern in the Merger Guidelines" 1992

Arnold & Porter Colloquium on Merger Enforcement, Washington, DC
"The Economic Foundations of the Merger Guidelines" 1992

American Bar Association, Section on Antitrust Law Leadership Council Conference, Monterey, CA
"Applying the 1992 Merger Guidelines" 1992

OECD Competition Policy Meeting, Paris, France
"The Economic Impacts of Antidumping Policy" 1992

Center for Public Choice Lecture Series, George Mason University Arlington, VA
"The Economic Impacts of Antidumping Policy" 1992

Brookings Institution Microeconomics Panel, Washington, DC,
"Discussion of the Evolution of Industry Structure" 1992

AT&T Conference on Antitrust Essentials
"Antitrust Standards for Mergers and Joint Ventures" 1991

ABA Institute on The Cutting Edge of Antitrust: Market Power
"Assessing and Proving Market Power: Barriers to Entry" 1991

Second Annual Workshop of the Competition Law and Policy Institute of New Zealand
"Merger Analysis, Industrial Organization Theory, and Merger Guidelines" 1991
"Exclusive Dealing and the Fisher & Paykel Case" 1991

Special Seminar of the New Zealand Treasury
"Strategic Behavior, Antitrust, and The Regulation of Natural Monopoly" 1991

Public Seminar of the Australian Trade Practices Commission
"Antitrust Issues of the 1990's" 1991

National Association of Attorneys General Antitrust Seminar
"Antitrust Economics" 1991

District of Columbia Bar's 1991 Annual Convention
"Administrative and Judicial Trends in Federal Antitrust Enforcement" 1991

ABA Spring Meeting
"Antitrust Lessons From the Airline Industry" 1991

Conference on The Transition to a Market Economy - Institutional Aspects
"Anti-Monopoly Policies and Institutions" 1991

Conference Board's Thirtieth Antitrust Conference
"Antitrust Issues in Today's Economy" 1991

American Association for the Advancement of Science Annual Meeting
"Methodologies for Economic Analysis of Mergers" 1991

General Seminar, Johns Hopkins University
"Economic Rationales for the Scope of Privatization" 1991

Capitol Economics Speakers Series
"Economics of Merger Guidelines" 1991

CRA Conference on Antitrust Issues in Regulated Industries
"Enforcement Priorities and Economic Principles" 1990

Pepper Hamilton & Scheetz Anniversary Colloquium
"New Developments in Antitrust Economics" 1990

PLI Program on Federal Antitrust Enforcement in the 90's
"The Antitrust Agenda of the 90's" 1990

FTC Distinguished Speakers Seminar
"The Evolving Merger Guidelines" 1990

The World Bank Speakers Series
"The Role of Antitrust Policy in an Open Economy" 1990

Seminar of the Secretary of Commerce and Industrial Development of Mexico
"Transitions to a Market Economy" 1990

Southern Economics Association
"Entry in Antitrust Analysis of Mergers" 1990
"Discussion of Strategic Investment and Timing of Entry" 1990

American Enterprise Institute Conference on Policy Approaches to the Deregulation of Network Industries
"Discussion of Network Problems and Solutions" 1990

American Enterprise Institute Conference on Innovation, Intellectual Property, and World Competition
"Law and Economics Framework for Analysis" 1990

Banco Nacional de Desenvolvimento Economico Social Lecture
"Competition Policy: Harnessing Private Interests for the Public Interest" 1990

Western Economics Association Annual Meetings
"New Directions in Antitrust from a New Administration" 1990
"New Directions in Merger Enforcement: The View from Washington" 1990

Woodrow Wilson School Alumni Colloquium
"Microeconomic Policy Analysis and Antitrust--Washington 1990" 1990

Arnold & Porter Lecture Series
"Advocating Competition" 1991
"Antitrust Enforcement" 1990

ABA Antitrust Section Convention
"Recent Developments in Market Definition and Merger Analysis" 1990

Federal Bar Association
"Joint Production Legislation: Competitive Necessity or Cartel Shield?" 1990

Pew Charitable Trusts Conference
"Economics and National Security" 1990

ABA Antitrust Section Midwinter Council Meeting
"Fine-tuning the Merger Guidelines" 1990
"The State of the Antitrust Division" 1991

International Telecommunications Society Conference
"Discussion of the Impact of Telecommunications in the UK" 1989

The Economists of New Jersey Conference
"Recent Perspectives on Regulation" 1989

Conference on Current Issues Challenging the Regulatory Process
"Innovative Pricing and Regulatory Reform" 1989
"Competitive Wheeling" 1989

Conference Board: Antitrust Issues in Today's Economy
"Foreign Trade Issues and Antitrust" 1989

McKinsey & Co. Mini-MBA Conference
"Economic Analysis of Pricing, Costing, and Strategic Business Behavior" 1989
1994

Olin Conference on Regulatory Mechanism Design
"Revolutions in Regulatory Theory and Practice: Exploring The Gap" 1989

University of Dundee Conference on Industrial Organization and Strategic Behavior
"Mergers in Differentiated Product Industries" 1988

Leif Johanson Lectures at the University of Oslo
"Normative Issues in Industrial Organization" 1988

Mergers and Competitiveness: Spain Facing the EEC
"Merger Policy" 1988
"R&D Joint Ventures" 1988

New Dimensions in Pricing Electricity
"Competitive Pricing and Regulatory Reform" 1988

Program for Integrating Economics and National Security: Second Annual Colloquium
"Arming Decisions Under Asymmetric Information" 1988

European Association for Research in Industrial Economics
"U.S. Railroad Deregulation and the Public Interest" 1987
"Economic Rationales for the Scope of Privatization" 1989
"Discussion of Licensing of Innovations" 1990

Annenberg Conference on Rate of Return Regulation in the Presence of Rapid Technical Change
"Discussion of Regulatory Mechanism Design in the Presence
of Research, Innovation, and Spillover Effects" 1987

Special Brookings Papers Meeting
"Discussion of Empirical Approaches to Strategic Behavior" 1987
"New Merger Guidelines" 1990

Deregulation or Regulation for Telecommunications in the 1990's
"How Effective are State and Federal Regulations?" 1987

Conference Board Roundtable on Antitrust
"Research and Production Joint Ventures" 1990
"Intellectual Property and Antitrust" 1987

Current Issues in Telephone Regulation
"Economic Approaches to Market Dominance: Applicability of Contestable Markets" 1987

Harvard Business School Forum on Telecommunications
"Regulation of Information Services" 1987

The Fowler Challenge: Deregulation and Competition in The Local Telecommunications Market
"Why Reinvent the Wheel?" 1986

World Bank Seminar on Frontiers of Economics
"What Every Economist Should Know About Contestable Markets" 1986
Bell Communications Research Conference on Regulation and Information
"Fuzzy Regulatory Rules" 1986

Karl Eller Center Forum on Telecommunications
"The Changing Economic Environment in Telecommunications: Technological Change and Deregulation" 1986

Railroad Accounting Principles Board Colloquium
"Contestable Market Theory and ICC Regulation 1986

Canadian Embassy Conference on Current Issues in Canadian -- U.S. Trade and Investment
"Regulatory Revolution in the Infrastructure Industries" 1985

Eagleton Institute Conference on Telecommunications in Transition
"Industry in Transition: Economic and Public Policy Overview" 1985

Brown University Citicorp Lecture
"Logic of Regulation and Deregulation" 1985

Columbia University Communications Research Forum
"Long Distance Competition Policy" 1985

American Enterprise Institute Public Policy Week
"The Political Economy of Regulatory Reform" 1984

MIT Communications Forum
"Deregulation of AT&T Communications" 1984

Bureau of Census Longitudinal Establishment Data File and Diversification Study Conference
"Potential Uses of The File" 1984

Federal Bar Association Symposium on Joint Ventures
"The Economics of Joint Venture Assessment" 1984

Hoover Institute Conference on Antitrust
"Antitrust for High-Technology Industries" 1984

NSF Workshop on Predation and Industrial Targeting
"Current Economic Analysis of Predatory Practices" 1983

The Institute for Study of Regulation Symposium: Pricing Electric, Gas, and Telecommunications Services Today and for the Future
"Contestability As A Guide for Regulation and Deregulation" 1984

University of Pennsylvania Economics Day Symposium
"Contestability and Competition: Guides for Regulation and Deregulation" 1984

Pinhas Sapir Conference on Economic Policy in Theory and Practice
"Corporate Governance and Market Structure" 1984

Centre of Planning and Economic Research of Greece
"Issues About Industrial Deregulation" 1984
"Contestability: New Research Agenda" 1984

Hebrew and Tel Aviv Universities Conference on Public Economics
"Social Welfare Dominance Extended and Applied to Excise Taxation" 1983

NBER Conference on Industrial Organization and International Trade
"Perspectives on Horizontal Mergers in World Markets" 1983

Workshop on Local Access: Strategies for Public Policy
"Market Structure and Government Intervention in Access Markets" 1982

NBER Conference on Strategic Behavior and International Trade
"Industrial Strategy with Committed Firms: Discussion" 1982

Columbia University Graduate School of Business, Conference on Regulation and New Telecommunication Networks
"Local Pricing in a Competitive Environment" 1982

International Economic Association Roundtable Conference on New Developments in the Theory of Market Structure

"Theory of Contestability" 1982
"Product Dev., Investment, and the Evolution of Market Structures" 1982

N.Y.U. Conference on Competition and World Markets: Law and Economics
"Competition and Trade Policy--International Predation" 1982

CNRS-ISPE-NBER Conference on the Taxation of Capital
"Welfare Effects of Investment Under Imperfect Competition" 1982

Internationales Institut fur Management und Verwalturg Regulation Conference
"Welfare, Regulatory Boundaries, and the Sustainability of Oligopolies" 1981
NBER-Kellogg Graduate School of Management Conference on the Econometrics of Market Models with Imperfect Competition
"Discussion of Measurement of Monopoly Behavior: An Application to the Cigarette Industry" 1981

The Peterkin Lecture at Rice University
"Deregulation: Ideology or Logic?" 1981

FTC Seminar on Antitrust Analysis
"Viewpoints on Horizontal Mergers 1982
"Predation as a Tactical Inducement for Exit" 1980

NBER Conference on Industrial Organization and Public Policy
"An Economic Definition of Predation" 1980

The Center for Advanced Studies in Managerial Economics Conference on The Economics of Telecommunication
"Pricing Local Service as an Input" 1980

Aspen Institute Conference on the Future of the Postal Service
"Welfare Economics of Postal Pricing" 1979

Department of Justice Antitrust Seminar
"The Industry Performance Gradient Index" 1979

Eastern Economic Association Convention
"The Social Performance of Deregulated Markets for Telecom Services" 1979

Industry Workshop Association Convention
"Customer Equity and Local Measured Service" 1979

Symposium on Ratemaking Problems of Regulated Industries
"Pricing Decisions and the Regulatory Process" 1979

Woodrow Wilson School Alumni Conference
"The Push for Deregulation" 1979

NBER Conference on Industrial Organization
"Intertemporal Sustainability" 1979

World Congress of the Econometric Society
"Theoretical Industrial Organization" 1980

Institute of Public Utilities Conference on Current Issues in Public Utilities Regulation
"Network Access Pricing" 1978

ALI-ABA Conference on the Economics of Antitrust
"Predatoriness and Discriminatory Pricing" 1978

AEI Conference on Postal Service Issues
"What Can Markets Control?" 1978

University of Virginia Conference on the Economics of Regulation
"Public Interest Pricing" 1978

DRI Utility Conference
"Marginal Cost Pricing in the Utility Industry: Impact and Analysis" 1978

International Meeting of the Institute of Management Sciences
"The Envelope Theorem" 1977

University of Warwick Workshop on Oligopoly
"Industry Performance Gradient Indexes" 1977

North American Econometric Society Convention
"Intertemporal Sustainability" 1979
"Social Welfare Dominance" 1978
"Economies of Scope, DAIC, and Markets with Joint Production" 1977

Telecommunications Policy Research Conference
"Transition to Competitive Markets" 1986
"InterLATA Capacity Growth, Capped NTS Charges and Long Distance Competition" 1985
"Market Power in The Telecommunications Industry" 1984
"FCC Policy on Local Access Pricing" 1983
"Do We Need a Regulatory Safety Net in Telecommunications?" 1982
"Anticompetitive Vertical Conduct" 1981
"Electronic Mail and Postal Pricing" 1980
"Monopoly, Competition and Efficiency": Chairman 1979

"A Common Carrier Research Agenda" 1978
"Empirical Views of Ramsey Optimal Telephone Pricing" 1977
"Recent Research on Regulated Market Structure" 1976
"Some General Equilibrium Views of Optimal Pricing" 1975

National Bureau of Economic Research Conference on Theoretical Industrial Organization
"Compensating Variation as a Measure of Welfare Change" 1976
Conference on Pricing in Regulated Industries: Theory & Application
"Ramsey Optimal Pricing of Long Distance Telephone Services" 1977

NBER Conference on Public Regulation
"Income Distributional Concerns in Regulatory Policy-Making" 1977

Allied Social Science Associations National Convention
"Merger Guidelines and Economic Theory" 1990
Discussion of "Competitive Rules for Joint Ventures" 1989
"New Schools in Industrial Organization" 1988
"Industry Economic Analysis in the Legal Arena" 1987
"Transportation Deregulation" 1984
Discussion of "Pricing and Costing of Telecommunications Services" 1983
Discussion of "An Exact Welfare Measure" 1982
"Optimal Deregulation of Telephone Services" 1982
"Sector Differentiated Capital Taxes" 1981
"Economies of Scope" 1980
"Social Welfare Dominance" 1980
"The Economic Definition of Predation" 1979
Discussion of "Lifeline Rates, Succor or Snare?" 1979
"Multiproduct Technology and Market Structure" 1978
"The Economic Gradient Method" 1978
"Methods for Public Interest Pricing" 1977
Discussion of "The Welfare Implications of New Financial Instruments" 1976
"Welfare Theory of Concentration Indices" 1976
Discussion of "Developments in Monopolistic Competition Theory" 1976
"Hedonic Price Adjustments" 1975
"Public Good Attributes of Information and its Optimal Pricing" 1975
"Risk Invariance and Ordinally Additive Utility Functions" 1974
"Consumer's Surplus: A Rigorous Cookbook" 1974

University of Chicago Symposium on the Economics of Regulated Public Utilities
"Optimal Prices for Public Purposes" 1976

American Society for Information Science
"The Social Value of Information: An Economist's View" 1975

Institute for Mathematical Studies in the Social Sciences Summer Seminar

"The Sustainability of Natural Monopoly" 1975

U.S.-U.S.S.R. Symposium on Estimating Costs and Benefits of Information Services
"The Evaluation of the Economic Benefits of Productive Information" 1975

NYU-Columbia Symposium on Regulated Industries
"Ramsey Optimal Public Utility Pricing" 1975

Research Seminars:

Bell Communications Research (2)
Bell Laboratories (numerous)
Department of Justice (3)
Electric Power Research Institute
Federal Reserve Board
Federal Trade Commission (4)
Mathematica
Rand
World Bank (3)
Carleton University
Carnegie-Mellon University
Columbia University (4)
Cornell University (2)
Georgetown University
Harvard University (2)
Attachment 1Hebrew University
Wyoming Johns Hopkins University (2)
University
M. I. T. (4)
New York University (4)
Northwestern University (2)
Norwegian School of Economics and
Business Administration
University of California, San Diego
University of Chicago
University of Delaware
University of Florida
University of Illinois
University of Iowa (2)
Universite Laval
University of Maryland
University of Michigan
University of Minnesota
University of Oslo
University of Pennsylvania (3)
University of Toronto
University of Virginia
University of Wisconsin
University of
Vanderbilt
Yale University (2)
Princeton University (many)
Rice University
Stanford University (5)
S.U.N.Y. Albany

ATTACHMENT 2

Expert Testimony Provided by Robert D. Willig in the Last Four Years
August 2014

1. In re: Rail Freight Fuel Surcharge Antitrust Litigation, In the United States District Court for the District of Columbia, MDL Docket No. 1869, Misc. No. 07-489 (PLF), expert report 8/1/2010, deposition 8/4/2010.

2. Before the Federal Reserve Bank: Docket Number R-1404: Proposed Rule on Debit Card Interchange Fees and Routing, written statement 2/22/2011.

3. Before the Surface Transportation Board: Docket Number EP 704: Review of Commodity, Boxcar, and TOFC/COFC Exemptions; written statement 1/31/2011; testimony at hearing 2/23, 24/2011.

4. New Zealand Commerce Commission vs. Malaysian Airline Systems Berhad, Ltd. and et. al.; High Court of New Zealand: CV 2008-404-8350, Brief of Evidence 4/28/2011, trial testimony 5/20/11 and 5/23-27/2011.

5. Before the Federal Communications Commission: Docket Number 11-65: For Consent to Assign or Transfer Control Licenses and Authorization, written reply statement 6/9/2011.

6. In Re: Checking Account Overdraft Litigation, MDL No. 2036 In the United States District Court for the Southern District of Florida, Miami Division, Case No. 09-MD-02036-JLK, Luquetta v. JPMorgan Chase Bank, Declaration In Support of JP Morgan Chase Bank, N.A.'s Opposition to Class Certification, June 16, 2011.

7. Before the Surface Transportation Board: Docket Number EP 705: Competition in the Rail Industry, written statement 4/12/2011, written reply statement 5/27/2011, testimony at hearing 6/22, 23/2011.

8. In the Matter of Rambus Inc. v. Micron Technology, Inc., et al. In the Superior Court of the State of California County of San Francisco, Civil Action No. 04-431105; expert report 11/08/2008; supplemental expert report 12/19/2008, deposition testimony 5/7/2009-5/8/2009, trial testimony 9/1,6,7/2011.

9. In Re McKesson Governmental Entities Average Wholesale Price Litigation, Master File No.: 1:08-CV-10843-PBS; The Board of County Commissioners of Douglas County, Kansas et al. v. McKesson Corp., expert report, April 14, 2010, Response Report, June 28, 2010; Related to Connecticut v. McKesson Corp., expert report, April 14, 2010; Related to Montana v. McKesson Corporation, expert report, November 8, 2010; Related to Oklahoma v. McKesson Corporation, expert report, November 8, 2010; San Francisco Health Plan, et al. v. McKesson Corporation, rebuttal expert report, 9/19/2011.

10. Before the Public Service Commission of Maryland, Case No.: 9271, In the Matter of the Merger of Exelon Corp. and Constellation Energy Group, Inc., written market power rebuttal

testimony, 10/17/2011, written surrebuttal testimony 10/26/2011, hearing testimony, 11/2011.

11. In Re TFT-LCD (Flat Panel) Antitrust Litigation, In the United States District Court Northern District of California San Francisco Division, DELL Inc., et. al., v. SHARP Corporation, et al., Case No. 3:10-cv-01064 SI MDL No. 3:07-md-1827-SI, expert report 2/23/2012, deposition 4/18/2012.

12. In Re TFT-LCD (Flat Panel) Antitrust Litigation, In the United States District Court Northern District of California San Francisco Division, Motorola Mobility Inc. v. SHARP Corporation, et al.,Case No. 3:09-cv-05840SI MDL No. 3:07-md-1827-SI, expert report 2/23/2012, deposition 4/18/2012.

13. In Re TFT-LCD (Flat Panel) Antitrust Litigation, In the United States District Court Northern District of California San Francisco Division, AT&T Mobility Inc. v. SHARP Corporation, et al.,Case No. 09-cv-4997 SI MDL No. 07-m-1827-SI, expert report 2/27/2012, deposition 4/18/2012.

14. In Re TFT-LCD (Flat Panel) Antitrust Litigation, In the United States District Court Northern District of California San Francisco Division, BEST BUY CO., Inc., et. al., v. AU OPTRONICS CORP., et al., Case No. 10-cv-4572 SI MDL No. 07-md-1827-SI, expert report 3/5/2012, deposition 4/18/2012.

15. Clark R. Huffman and Brandi K. Winters, individually and on behalf of all others similarly situated vs. PRUDENTIAL INSURANCE COMPANY of AMERICA, In the United States District Court for the Eastern District of Pennsylvania, Civ. No. 2:10-cv-05135-EL, declaration 4/10/2012.

16. In re Prudential Insurance Company of America SGLI/VGLI Contract Litigation, CLASS ACTION, Master Case No. 3:11-md-02208-MAP, In the United States District Court for the District of Massachusetts, declaration 5/10/2012.

17. Australian Competition and Consumer Commission v. Singapore Airlines Cargo PTE LTD et. al., Before the Federal Court of Australia, District Registry: New South Wales, Division: General, No. NSD 1980 of 2008, NSD 363 of 2009, NSD 876 of 2009 and NSD 1213 of 2009, affidavit and expert report 7/12/2012.

18. Bandspeed, Inc. v. Sony Electronics, Inc. et al. and Cambridge Silicon Radio Limited, Cause No. A-11-CV-771-LY, In the United States District Court for the Western District of Texas, Austin Division, expert reports 9/21/2012, 8/01/2013, 11/01/2013, declaration 11/19/2013, deposition 1/10/2014.

19. M&G Polymers USA, LLC v. CSX Transportation, Inc., Before the Surface Transportation Board, Docket Number NOR 42123, verified statement, 11/27/2012.

20. National Collegiate Athletic Association et al., Plaintiffs, v. Christopher J. Christie et al., Defendants, In the United States District Court for the District of New Jersey, Civil Action No. 3:12-cv-04947 (MAS) (LHG), expert report 11/21/2012, deposition 11/30/2012.

21. In Re Cathode Ray Tube (CRT) Antitrust Litigation, In the United States District Court Northern District of California San Francisco Division, Master File No. CV-07-5944-SC MDL No. 1917, expert report 12/17/12, deposition 01/24/12, declaration 3/25/2013, expert report 9/11/2013.

22. In Re Titanium Dioxide Antitrust Litigation, In the United States District Court of Maryland Northern Division, Case No. 1:10-cv-00318-RDB, expert report 12/21/2012, deposition testimony 02/07/2013, 02/08/2013.

23. PPL EnergyPlus, LLC, et al., v. Douglas R.M. Nazarian, in his official capacity as Chairman of the Maryland Public Service Commission, et al., In the United States District Court of Maryland Northern Division, Case No. 1:12-cv-01286-MJG, expert report 12/21/2012, supplemental expert report 02/01/2013, deposition testimony 02/14/2013, trial testimony 03/08/2013.

24. PPL EnergyPlus, LLC, et al., v. Robert Hanna (originally, Lee A. Solomon), in his official capacity as President of the New Jersey Board of Public Utilities, et al., In the United States District Court for the District of New Jersey, Case No. 3:11-cv-00745-PGS-DEA, expert report 02/06/2013, deposition 02/14/2013 and 02/21/2013, and trial testimony 4/9-10/2013.

25. Total Petrochemicals & Refining USA, Inc. v. CSX Transportation, Inc., Before the Surface Transportation Board, Docket Number NOR 42121, verified statement, 06/20/2013.

26. Australian Taxation Office - Rio Tinto Limited transfer pricing rules mediation matter, Expert Reports: 11/14/2013; 11/24/2013; and 5/15/2014.

27. Statement and Reply Statement of Robert Willig and Gustavo Bamberger, filed with the U.S. Securities and Exchange Commission, File No. SR-Phlx-2013-113, on behalf of NASDAQ OMX PHLX LLC, 1/24/2014 (Statement); and 5/20/2014 (Reply Statement).

28. GSI Technology, Inc. v. Cypress Semiconductor Corporation, In the United States District Court for the Northern District of California, Civil Action No. 5:11-cv-03613-EJD; expert report 3/28/2014, deposition 5/29/2014.

29. Amazon.com Inc. v. Commissioner, Tax Court Docket No. 31197-12; expert report 6/6/2014; rebuttal report 8/1/2014.

ATTACHMENT 3

Attachment 3: Materials Relied Upon

Legal Filings

Indirect Purchaser Plaintiffs' Fourth Consolidated Amended Complaint, January 10, 2013

Expert Materials

Declaration of Janet S. Netz, Ph.D., in Support of Motion of Indirect-Purchaser Plaintiffs for Class Certification, October 1, 2012, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division)

Expert Report of Robert D. Willig, Indirect Purchaser Class Action, December 17, 2012, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division)

Rebuttal Declaration of Janet S. Netz, Ph.D., in Support of Motion of Indirect-Purchaser Plaintiffs for Class Certification, February 15, 2013, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division)

Declaration of Janet S. Netz, Ph.D., in Support of Indirect-Purchaser Plaintiffs' Opposition to Defendants' Motion to Strike the Proposed Expert Testimony of Dr. Janet S. Netz, February 15, 2013, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division)

Rebuttal Declaration of Robert D. Willig, Indirect Purchaser Class Action, March 25, 2013, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division)

Expert Report of Robert D. Willig, Direct Purchaser Class Action, September 10, 2013, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division)

Expert Report and Backup of Janet S. Netz, Ph.D., April 15, 2014, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division)

Errata to the Expert Report of Janet S. Netz, Ph. D., July 3, 2014, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division)

Depositions and Exhibits

de Moor, Roger (PENAC), Volume I, July 31, 2012

de Moor, Roger (PENAC), Volume II, August 1, 2012

Heinecke, Jay (TAEC), July 31, 2012

Iwasawa, Toru (Hitachi), July 11, 2012

Kurosawa, Koji (Toshiba), July 30, 2012

Lee, Jaein (SDI), Volume I, June 6, 2012

Lee, Jaein (SDI), Volume II, June 7, 2012

Nakano, Takashi (PNA, MTPD), July 13, 2012

Netz, Ph.D., Janet (Expert), June 27, 2014

Park, Sang-Kyu (SDI), Volume III, March 22, 2013

Son, Michael (SDI), Volume I, February 5, 2013

Son, Michael (SDI), Volume II, February 6, 2013

Tobinaga, Tatsuo (MTPD), Volume I, July 16, 2012

Tobinaga, Tatsuo (MTPD), Volume II, July 17, 2012

Uchiyama, Yoshiaki (TACP), August 1, 2012

Public Documents

CFR 2011, Title 16, Volume 1, Part 410

International Labour Organization, *Consumer Price Index Manual: Theory and Practice*, 2004

United States Department of Justice and the Federal Trade Commission, *Horizontal Merger Guidelines*, 2010

United States International Trade Commission, *Color Picture Tubes from Canada, Japan, Korea, and Singapore, Investigations Nos. 731-TA-367-370 (Review), Determinations and Views of the Commission*, USITC Publication No 3291, 2000

Academic Texts

ABA Section of Antitrust Law, "Proving Antitrust Damages: Legal and Economic Issues," Second Edition, 2010

Bali, S. P., *Colour Television: Theory and Practice*, Delhi: Tata McGraw-Hill Publishing Company Limited, 1994, p. 83

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Rosenfield, A., Carlton, D., and Gertner, R., "Communication Among Competitors: Game Theory and Antitrust," *George Mason Law Review*, Vol. 5, No. 3, 1997, pp. 423–440

Rubinfeld, Daniel L., "Quantitative Methods in Antitrust," *Issues in Competition Law and Policy*, Vol. 723, No. 1, (ABA Section of Antitrust Law 2008)

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News, Press and Websites

Pereira, Pedro, "Higher monitor prices looming—Shortages of cathode ray tubes, higher production costs in Japan taking a toll," *Computer Reseller News*, #625, April 10, 1995

"Corning Asahi Expanding Glass, Adding 35"," *Consumer Electronics*, July 10, 1995

Other Documents

033 - 2011-06-01.pdf

2009-04-20 - Investigation of the Causes of the Bankruptcy of LG Philips Displays

Chunghwa Picture Tubes_2003 Consolidated Financial Statements.pdf

Chunghwa Picture Tubes_2004 Consolidated Financial Statements.pdf

Chunghwa Picture Tubes_2005 Consolidated Financial Statements.pdf

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Data and Programs Relied Upon by Janet S. Netz, Ph.D.

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IHS iSuppli, "Television Systems Market Tracker - Q2 2008 Database.xls"

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IHS iSuppli, "Television Systems Market Tracker - Q4 2008 Database.xls"

IHS iSuppli, "Television Systems Q1 2003 Market Tracker.xls"

IHS iSuppli, "Television Systems Q1 2004 Market Tracker.xls"

IHS iSuppli, "Television Systems Q1 2005 Market Tracker.xls"

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IHS iSuppli, “Worldwide Monitor Q2 2003 MarketTracker.xls”

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IHS iSuppli, “Worldwide Television Q1 2010 Market Tracker Database.xls”

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CHU00028252E
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CHU00028463E
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CHU00028495E
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TSB-CRT-00041862E

EXHIBIT 4

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

IN RE: CATHODE RAY TUBE (CRT) ANTITRUST LITIGATION This document relates to: ALL INDIRECT PURCHASER ACTIONS	Master File No. CV-07-5944-SC MDL No. 1917

EXPERT REPORT OF MARGARET E. GUERIN-CALVERT

August 5, 2014

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I. INTRODUCTION

A. Qualifications

1. I am Senior Consultant at Compass Lexecon, a consulting firm that specializes in antitrust economics and applied microeconomics, and a founding director of its predecessor, Compass (Competition Policy Associates). I am also Senior Managing Director of FTI Consulting, Inc. I am trained as an industrial organization economist, which is the branch of economics that involves the study of firms, industries, consumer behavior, and pricing. I have worked as an economist on issues related to competition and competition policy involving a variety of industries since 1979. During this thirty-five year period, I have reviewed a large number of competition issues and cases, including many mergers and claims regarding market power, coordinated effects, and market conditions, and served as an economist both in government and in the private sector. In addition, I have worked on a wide variety of issues involving assessment of industry conditions in manufacturing, healthcare, network industries and electronic commerce, including assessment of joint ventures and innovation as well as issues related to licensing. Among other positions, I served as Assistant Chief of the Economic Regulatory Section at the Antitrust Division of the U.S. Department of Justice ("DOJ") from 1990 to 1994, where I was responsible for supervision of mergers, civil case investigations, and regulatory filings in a wide array of regulated and unregulated industries. I also was a Principal at Economists Incorporated, where I worked on a number of matters involving evaluation of competition in a wide variety of industries.

2. I have written and edited numerous articles on industrial organization and competition policy. I also co-edited and wrote chapters for a book on these subjects. I taught economics at the Institute of Policy Sciences at Duke University. Publications include "Assessing Hospital Mergers and Rivalry in An Era of Health Care Reform," in *Antitrust Magazine*, Summer 2013 (with Jeff Brennan), "Coordinated Effects Analysis: Cruise Line Mergers (2002) in *The Antitrust Revolution*, 2009, and "The Role of the Economist/Economics in 'Proving' Coordinated Effects," the Milton Handler Annual Antitrust Review sponsored by the Association of the Bar of the City of New York, published in *Columbia Business Law Review*, 2005. I have testified as an economic expert in a number of court proceedings or administrative hearings, both in the U.S. and internationally on a wide variety of matters including matters related to coordinated effects and damages. I have testified before the Federal Trade Commission ("FTC") and DOJ Hearings on Intellectual Property on issues related to incentives and innovation and before the FTC and DOJ Hearings on Healthcare and on Merger Guidelines. My professional expertise, including my experience in testimony in the last four years at trial or deposition, is set out in detail in my curriculum vitae, which is attached at Appendix A.

B. Overview and Assignment

3. Plaintiffs in this matter are indirect purchasers of finished products that contain cathode ray tubes ("CRTs"), such as televisions and computer monitors. Plaintiffs allege that the "Defendants[1] conspired to fix,

[1] The named Defendants are: BMCC; IRICO; LG.Philips Displays (an independent joint venture that combined LG's and Philips' CRT manufacturing businesses); Panasonic Corporation, Panasonic Corporation of North America, MT Picture Display Co. (an independent entity that combined Panasonic Corporation's and Toshiba Corp.'s CRT businesses in 2003); Koninklijke Philips Electronics N.V., Philips Electronics North America Corporation, Philips Electronics Industries (Taiwan), Ltd., Philips da Amazonia Industria Electronica Ltda.; Samsung SDI Co., Ltd., Samsung SDI America, Inc., Samsung SDI Mexico S.A. de C.V., Samsung SDI Brasil Ltda., Shenzhen Samsung SDI Co., Ltd., Tianjin Samsung SDI Co., Ltd, Samsung SDI (Malaysia) Sdn. Bhd.; Samtel, Thai CRT; Toshiba Corporation, Toshiba America, Inc., Toshiba America Consumer Products, L.L.C., Toshiba America Information Systems, Inc., Toshiba America Electronic Components, Inc.;

raise, maintain and/or stabilize prices of CRT Products sold in the United States. Because of Defendants' unlawful conduct, Plaintiffs and other Class Members paid artificially inflated prices for CRT Products and have suffered antitrust injury to their business or property."[2]

4. The IPPs have retained Dr. Janet Netz to offer expert economic testimony related to their claims. Dr. Netz concludes that "the cartel was successful in raising price above the competitive level."[3] Dr. Netz also concludes that "class members were harmed as a result of the cartel's actions."[4] Dr. Netz bases these conclusions on her review of a number of contemporaneous documents and on economic and empirical analyses. Dr. Netz also attempts to estimate the harm allegedly suffered by class members using econometric analysis, and concludes that "CDTs (the CRTs used to make monitors) were overcharged at the rate of 25.0% for 1995Q2-2006Q4 and 12.3% for 2007Q1 to 2007Q4 and CPTs (the CRTs used to make TVs) were overcharged at the rate of 9.5% and 3.2% [during the same periods. She] conclude[s] that at least 100% of the overcharge was passed through to class members … [and] calculate[s] that the damages borne by class members who purchased CRT monitors was $2.296 billion and CRT TVs was $780 million, for a total of $3.076 billion."[5]

5. I have been asked by counsel for several Defendants in this matter[6] to assess whether the economic analyses related to the impact of the alleged conspiracy among CDT manufacturers and the estimated overcharges on CDT sales provided by Dr. Janet Netz, provide a reliable and economically sound basis to estimate damages to the IPP class. In undertaking this assignment, I conducted an economic analysis of the document-based and other analyses presented by Dr. Netz in support of her allegations that the conduct of the defendant manufacturers resulted in a highly effective conspiracy and substantial collusive overcharges on CDTs during the alleged conspiracy period. I also conducted a detailed analysis of Dr. Netz's attempts to quantify the alleged CDT overcharges, including underlying assumptions and econometric analysis. Based on these analyses, I determined that Dr. Netz's analyses have numerous significant economic and statistical problems, and, as a result, greatly overstate any applicable overcharges. After making economically reasonable corrections for some of the most significant problems in Dr. Netz's econometric analysis, I re-estimated and provide here the resulting alternative estimates of CDT overcharges that could be used as one of the inputs needed to assess the damages incurred by

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Hitachi, Ltd., Hitachi Displays, Ltd. (n/k/a Japan Display Inc.), Hitachi Asia, Ltd., Hitachi America, Ltd., Hitachi Electronic Devices (USA), Inc.; and Shenzhen SEG Hitachi Color Display Devices, Ltd.

[2] Indirect Purchaser Plaintiffs' Fourth Consolidated Amended Complaint, In re: Cathode Ray Tube (CRT) Antitrust Litigation, January 10, 2013 (United States District Court Northern District of California San Francisco) – (hereafter "IPP Complaint"), at ¶1.

[3] Netz, Janet S., Ph.D., 15 April 2014, Expert Report of Janet S. Netz, Ph.D., In re: Cathode Ray Tube (CRT) Antitrust Litigation, (Hereinafter "Netz Expert Report"), at 6.

[4] Netz Expert Report, at 6.

[5] Netz Expert Report, at 6. Dr. Netz issued an errata in which these estimates were revised. For example, the CDT overcharge was revised to 22.0% for 1995Q2-2006Q4 and 11.4% for 2007. 03 July 2014, Errata to the Expert Report of Janet S. Netz, Ph.D., In re: Cathode Ray Tube (CRT) Antitrust Litigation, at 1.

[6] I have been retained by Winston & Strawn LLP representing Panasonic Corporation of North America, MT Picture Display Co., Ltd., and Panasonic Corporation (f/k/a Matsushita Electrical Industrial Co.); Kirkland & Ellis LLP representing Hitachi, Ltd., Hitachi Asia, Ltd., Hitachi America, Ltd., Hitachi Electronic Devices (USA), Inc., and Hitachi Displays, Ltd. (n/k/a Japan Display Inc.) (collectively, the "Hitachi Defendants" or "Hitachi"); White & Case LLP representing Toshiba America Consumer Products, L.L.C., Toshiba America Electronic Components, Inc., Toshiba America, Inc., Toshiba America Information Systems, Inc., and Toshiba Corporation; Sheppard, Mullin, Richter & Hampton LLP representing Samsung SDI America, Inc., Samsung SDI Co. Ltd., Samsung SDI (Malaysia) Sdn. Bhd., Samsung SDI Mexico S.A. De C.V., Samsung SDI Brasil Ltda., Shenzen Samsung SDI Co., Ltd., and Tianjin Samsung SDI Co., Ltd.; and Baker Botts LLP representing Koninklijke Philips N.V., Philips Electronics North America Corporation, Philips Taiwan Limited, and Philips do Brasil Ltda..

the indirect purchaser class. I do not analyze the impact (if any) of the alleged CDT cartel on the prices of computer monitors purchased by members of the IPP class during the class period. I understand that this analysis will be a subject of Professor Janusz Ordover's testimony.

6. In conducting my analyses, I applied standard economic principles and methods customarily used by economists in evaluation of coordinated effects, impact and damages in my evaluation of Plaintiffs' and Dr. Netz's claims. My staff and I reviewed a variety of materials relevant to this case, including: (1) court filings made by the Plaintiffs and Defendants in this case; (2) discovery documents produced by Defendants and Plaintiffs; (3) deposition testimony; and (4) detailed data on CDT sales, production, capacity and other factors produced by the Defendants. Additionally, my staff and I reviewed the relevant data, programs and documents produced by Dr. Netz in support of her opinions and considered the relevant economic literature. A list of the materials I relied on in this matter is attached as Appendix B.

7. My analysis is ongoing and I reserve the right to evaluate any new reports or analysis produced by Plaintiffs or their experts as well as to incorporate new information into my analysis and opinions as necessary.

C. Summary of Conclusions

8. Based on an application of standard economic principles and methods used to evaluate claims of alleged collusive conduct and potential impact on prices and other market conditions to the facts of this industry, and specifically to the analyses and conclusions set out in Dr. Netz' report, I reached the following conclusions:

9. Both the underlying economic conditions of supply, demand and competition as well as the allegations of collusive conduct differ substantially for CDTs and CPTs. Accordingly, it makes economic sense to analyze the impact and damages of the alleged cartel separately for CPTs and CDTs. This is consistent with the fact that Dr. Netz analyzes the alleged collusive conduct and estimates overcharges separately for CDTs and CPTs.[7]

10. Application of the economic literature on cartels to the facts of the CDT industry reveals several factors that make effective coordination of pricing and thereby alleged collusive overcharges difficult and hence less likely to be successful both generally, and in the CDT industry.

a. Collusion is more difficult in dynamic industries – including those characterized by substantial changes in output and capacity among competitors relative to the market – as can be evidenced by changing market shares, many and varied products introduced over time and/or at the same time along with significant changes in demand, substitute products, competitive conditions, or technology.

b. Collusion is more difficult where competitors vary substantially in important characteristics and/or where these are changing over time.

c. Collusion is more difficult when products are heterogeneous and prices are changing frequently and are difficult to monitor.

11. Plaintiffs' and Dr. Netz' claims of a highly effective conspiracy generating large collusive overcharges ignore or are at odds with basic empirical evidence on CDT prices, capacity, output and their drivers.

[7] See Section I. D below

a. CDT price patterns at the beginning and end of the alleged cartel do not support the alleged effective collusive arrangement described by Plaintiffs and Dr. Netz nor substantiate significant overcharges. Instead, patterns of CDT prices at the beginning of the alleged cartel period are consistent with underlying demand and supply economics and cannot reasonably be attributed to the alleged conspiracy. Similarly, CDT prices did not exhibit unusually sharp drops or faster rates of decline after the end of the alleged cartel period. In fact, looking at the alleged cartel period as a whole, CDTs prices declined at a much faster rate during the alleged cartel than they did either before or after.

b. CDT capacity and output grew very rapidly during the early years of the alleged cartel (until about 2000) with investments by several different competitors in capacity and new products. While demand for computer monitors grew rapidly, CDT capacity and output ultimately grew even more rapidly, leading to substantial excess capacity, price and non-price rivalry and rapidly declining prices – factors inconsistent with an effective cartel constraining capacity, output or pricing. Accordingly, this provides evidence against claims of an effective conspiracy producing substantial overcharges during this period.

c. The experience of continually declining CDT prices, ongoing changes in demand and capacity and lack of price transparency along with near constant downward revisions in the "target prices" and deviations of actual prices from “target prices” of the alleged cartel, challenge the notion that the alleged cartel was able to effectively control CDT prices over the long alleged cartel period.

d. Significant changes in market shares and other factors are inconsistent with Dr. Netz’s allegations that the defendants successfully colluded on market shares, capacity and output. Firms such as SDI, Chunghwa, LG and LPD expanded capacity as well as output much more aggressively than their rivals and gained substantial market share. Other alleged conspirators, notably the Japanese manufacturers, lost substantial market share. Several of these manufacturers eventually exited the industry completely.

e. Dr. Netz’s empirical and qualitative analyses fail to account for these factors appropriately in the economic analyses of prices, capacity, output and claimed overcharges.

12. Dr. Netz’s analyses of alleged collusive conduct do not imply a highly effective conspiracy or large overcharges.

a. Actual CDT prices were frequently below target prices and both CDT prices and price changes show wide variation from alleged target prices and changes in them.

b. Dr. Netz fails to establish effective collusive restriction of industry capacity or output.

13. Dr. Netz’s own econometric model of CDT overcharges undermines her claim that the alleged cartel had a class-wide impact.

a. In fact, if we only add additional indicator variables to Dr. Netz’s model for 1995 and 1996 -- a time period that was substantially influenced by tight capacity and increased demand-- and make no other changes to the model, the overcharge for 1997-2006 declines from Dr. Netz’s

reported figure of 22 percent to a statistically insignificant level of -14.4 percent. This would imply zero overcharges for any class member that purchased CDTs during this period. Similarly, replacing the Netz conspiracy variable with annual indicator variables for each year, the overcharges generally are negative from 1997-2007.

14. Dr. Netz's model of CDT overcharges is fundamentally unreliable and does not support a claim of substantial overcharges.

a. Dr. Netz's econometric model implausibly implies that collusive "overcharges" were concentrated in 1995 and 1996, years for which she offers very little evidence of collusive conduct and where she ignores fundamental economic conditions. Moreover, there are other, much more economically plausible explanations for price changes and levels during this period, given the strong demand for CDTs, shortages of CDT and glass capacity and other non-conspiracy factors affecting prices at this time, which were widely recognized in contemporaneous documents.

b. Dr. Netz's model does not adequately account for the fundamental economic changes in the CDT industry during 1993-2008.

c. Dr. Netz's model is highly unreliable and not at all robust. Small changes in model specification and explanatory variables yield large and implausible changes in results.

15. Despite these fundamental flaws, if Dr. Netz's model were to be used to estimate CDT overcharges, then several basic problems with her model should be corrected. I have provided an alternative estimate of overcharges that makes a number of economically reasonable adjustments to the Netz model. First, I have relaxed the arbitrary assumption of a constant overcharge over the entire 1995-2006 period by replacing Dr. Netz's single variable for 1995-2006 with three separate variables for 1995, 1996 and 1997-2006. Since the evidence indicates that the estimated effects for 1995 and 1996 were caused predominantly by underlying economic conditions unrelated to the alleged conspiracy, I have used the overcharge percentage estimated from this adjusted model for the period 1997-2006 as the estimated overcharge for sales in the years 1995 and 1996 as well. I believe this approach is conservative because Dr. Netz and the Plaintiffs allege that there was far greater collusive activity during 1997-2006 than there was in 1995 and 1996. I have also added a number of additional economically reasonable control variables that significantly improve the performance of the Netz model. Lastly, I have corrected Dr. Netz's arithmetic error in applying the overcharge percentage to the estimated CDT revenue.

16. When I make economically appropriate corrections for these major flaws in Dr. Netz's model, the overall average overcharge percentage for 1995-2006 declines from Dr. Netz's reported figure of 22 percent to an estimate of 1.6 percent.

D. It makes economic sense to analyze CDTs separately from CPTs

17. A cathode ray tube (CRT) is a display technology that operates by shining an electron beam onto a phosphor-coated panel, causing the phosphors to glow, emitting red, green, and blue light to make a picture. The CRTs used in making computer monitors are called color display tubes or "CDTs" while those used in televisions are color picture tubes or "CPTs." I understand that CPTs and CDTs are characterized by substantially different physical properties. For example, high brightness is relatively important for CPTs, while high resolution is

relatively important for CDTs.[8] CDTs were the dominant display technology that was used to produce computer monitors during the 1990s and early 2000s when it began to be displaced by alternative technologies such as LCDs. As described in detail in Section II below, different types of CDTs also were differentiated among themselves, with substantially varying characteristics and prices.

18. In addition to the substantial differences in their physical characteristics, there were very substantial differences in the economic environment that determined the prices and quantities of CDTs and CPTs during the period for which Plaintiffs allege that these conspiracies operated. Most obviously, there is no substitutability of one product for the other on the demand side of the market. Firms seeking to purchase CDTs in order to produce computer monitors cannot instead purchase CPTs. Similarly, while there is some overlap in terms of the firms that produce CDTs and CPTs, there are substantial differences on the supply side of the market. The products are generally produced on different production lines, often in different geographic regions[9] and are typically sold to different customers via different distribution channels under separate negotiations and terms of sale. As shown in Figure 1, the economic forces driving the supply and demand for CDTs also were substantially different than those for CPTs during the alleged conspiracy period. In particular, CDTs experienced a "boom" period with rapid growth of demand, capacity and output during 1992-2000 as demand for desktop computers grew rapidly. This was followed by a "bust" period of rapid declines in demand due to the tech bust of 2000-2001 and growth of laptops / LCD substitution during 2000-2008. Accordingly, CDTs experienced substantially more rapid growth in demand, capacity and output during 1992-2000 than did CPTs. While annual CPT production grew by 65 percent from 1992 to 2000, CDT production grew by 221 percent.[10] CDTs also experienced a much earlier and more rapid decline in demand due to substitution from LCDs than did CPTs.[11] While annual CPT production grew by a slight six percent from 2000 to 2006, CDT production plummeted by -72 percent. As shown in Figure 1, the boom and bust nature of CDT demand also translated into volatile CDT prices during the relevant period. CDTs experienced substantially larger declines in prices than did CPTs, particularly during 1996-1998. Close linkages of demand and supply forces for CDTs and CPTs are belied by such dramatically different patterns in prices. These substantial differences in the economic forces driving the supply and demand for CDTs vs. CPTs, make it economically appropriate to analyze Plaintiffs' allegations regarding CDTs separately from those for CPTs.

[8] See, e.g.,
- SDCRT-0021278 – SDCRT-0021294, at 1288.
- 16 July 2012, Deposition of Tatsuo Tobinaga, Volume 1, at 143:7-23.

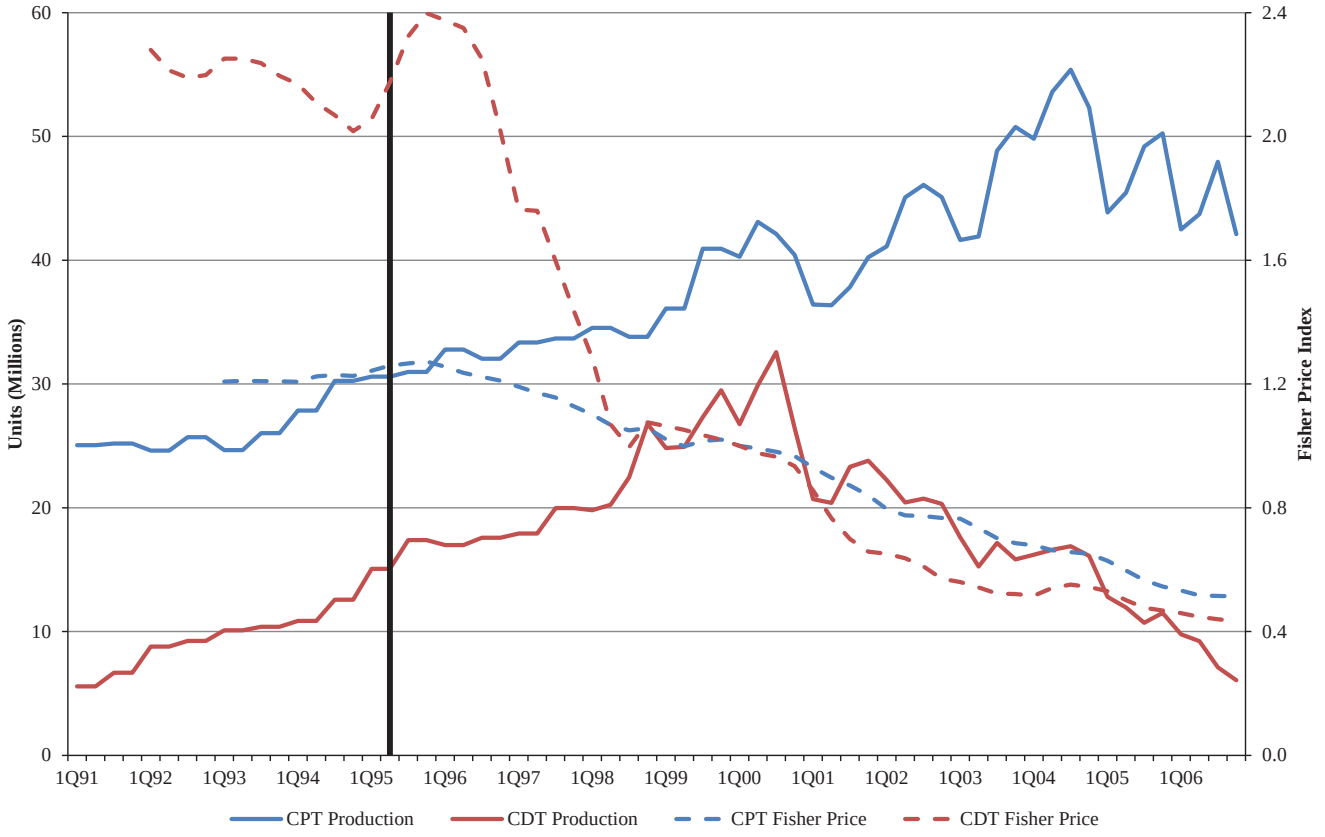
[9] "During the class period, the geographic source of CDT and CPT finished goods that were sold in the U.S. differed. Almost all CDT and monitor production destined for the U.S. market took place in Asia while a significant portion of CPT and TV production destined for U.S. consumers took place closer to the U.S. final consumers." Netz Expert Report, at 72.

[10] These calculations are detailed in my backup file "a054_total production.xlsx."

[11] See, e.g., LPD-NL00173522 – LPD-NL00173655, at 3585.

Figure 1

CPT and CDT Production and Fisher Price Indices



Note(s): Vertical line marks beginning of alleged cartel conspiracy. Base period for both Fisher price indices is 2000Q1.
Data Source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibits 64 and 82.
Source File(s): all_defendants_dropexout_collapsed.dta; total production.xlsx; tukey filter.do; fisher app-quarter.do; fisher_app_q.xlsx; a001_fisher_app_quarter.xlsx

19. Despite these substantial differences in the underlying supply and demand factors, Dr. Netz appears to argue that there was a single conspiracy that "encompassed both CPTs and CDTs."[12] However, in addition to ignoring the major differences in supply and demand factors, this opinion also ignores the fact that the vast majority of the alleged collusive conduct claimed by Dr. Netz is separate for CDTs and CPTs. Dr. Netz's report references specific incidents that Dr. Netz identifies as numerous individual instances of alleged collusive conduct. The vast majority of these incidents appear to relate to only CDTs or CPTs, not both. For example, the vast majority of alleged collusive meetings identified by Dr. Netz appear to have been separate, and the specifics of alleged conducts (such as alleged output restrictions) are separate and in many cases qualitatively different.[13] To a large extent, Dr. Netz does not appear to disagree with the import of these factors. She analyzes the alleged anticompetitive conduct separately for CDTs and CPTs, and estimates separate overcharge models as well.

20. Moreover, as I discuss in detail in Section II below, several factors make effective coordination of economic activity or alleged conspiracy more difficult – for example, where there are substantial differences across competitors in terms of important competitive characteristics. It is also more difficult when the industry in

[12] Netz Expert Report, at 2.
[13] See, e.g. Netz Expert Report, at 41-61.

question is dynamic and subject to many and varying changes in supply, demand and competitive factors over time. While I discuss in detail below how these factors would raise very substantial impediments to an effective CDT cartel, the complexity would increase even more dramatically if the necessarily broader group of alleged cartel participants were simultaneously attempting to coordinate across CDTs and CPTs. For all of these reasons, I have focused my analysis exclusively on the allegations regarding CDTs.

II. DR. NETZ'S ANALYSIS OF THE ECONOMIC LITERATURE ON CARTELS DOES NOT IMPLY THAT THE ALLEGED CONSPIRACY NECESSARILY WAS EFFECTIVE OR THAT OVERCHARGES WERE LARGE IN THE CDT INDUSTRY.

21. The economic literature on cartels recognizes that individual firms have powerful incentives to deviate from a collusive agreement in order to increase their individual profit.[14] Cartels only succeed to the extent that they can put mechanisms in place that limit participating firms' *incentives* and ability to pursue these individual interests at the expense of the group interest. Dr. Netz recognizes this fact when she states: "Whether a cartel will succeed in increasing price above the competitive level is determined by which of the two fundamental incentives dominates, the incentive to monopolize or the incentive to cheat. While economic theory tells us that cartel members are subject to both incentives, economic theory alone cannot tell us which incentive prevails in a particular situation: *whether a cartel succeeds is an empirical question*."[15]

22. In particular, cartels require mechanisms that allow *effective monitoring* of the behavior of participants.[16] They also need mechanisms to *punish* firms that deviate from the agreed course of conduct and potentially compensate other cartel members who are harmed by such cheating.[17] Moreover, such mechanisms for monitoring, enforcement, and punishment must adapt continually over time as the industry evolves. For this reason, the literature recognizes that cartels are less likely to succeed in dynamic industries where market conditions are changing substantially over time.[18]The economic evidence reviewed in this report indicates that the

[14] See, e.g.,
- Levenstein, Margaret C. and Valerie Suslow, "What Determines Cartel Success?" Journal of Economic Literature, Vol. 44(1), March 2006, at 45-46.
- Dennis W. Carlton and Jeffrey M. Perloff (2005), Modern Industrial Organization, 4th edition (Hereinafter "Carlton and Perloff (2005)"), at 122-154.
- Stigler, George J., "A Theory of Oligopoly," Journal of Political Economy, Vol. 72(1), February 1964, at 46.

[15] Netz Expert Report, at129. [Emphasis added.]

[16] "Upon its creation, a cartel immediately faces three key problems: coordination, cheating, and entry. Firms must be able to coordinate on an equilibrium—in a situation in which there are often multiple equilibria—which increases prices and allocates reduced output among member firms. The equilibrium must increase profits to cartel members as a group and provide a mechanism for distributing those profits 'fairly' to member firms." Levenstein & Suslow (2006), at 45.

[17] One article states: "Second, interfirm sales or other forms of compensation, as the use of asymmetric punishments is essential to effective collusion (a point originally made by Harrington and Skrzypacz 2007)." Joseph E. Harrington and Andrzej Skrzypacz (2011), Private Monitoring and Communication in Cartels: Explaining Recent Collusive Practices, *American Economic Review*, 101(6): 1-25, at 18.

[18] For example, one widely cited study stated: "Cartels break up occasionally because of cheating or lack of effective monitoring, but the biggest challenges cartels face are entry and adjustment of the collusive agreement in response to changing economic conditions. Cartels that develop organizational structures that allow them the flexibility to respond to these changing conditions are more likely to survive. Price wars that erupt are often the result of bargaining issues that arise in such circumstances. Sophisticated cartel organizations are also able to develop multipronged strategies to monitor one another to deter cheating and a variety of interventions to increase barriers to entry." See Levenstein, Margaret C. and Valerie Suslow, "What Determines Cartel Success?" Journal of Economic Literature, Vol. 44(1), March 2006, at 43.

alleged CDT cartel had characteristics inconsistent with those typically considered important to cartel success – and for which empirical tests demonstrate conduct or factors inconsistent with effective cartels. For example, as discussed further in Section III.B below, the alleged CDT cartel appears to have experienced limited adherence to target prices. Empirical evidence shows that CDT prices and price changes varied widely and there was widespread pricing below target prices. The evidence shows that approximately 80 percent of CDT sales for which Dr. Netz identified a target price were sold below that target price.[19]

23. Similarly, as discussed further in Sections III.C and D below, the empirical evidence is inconsistent with effective capacity and output coordination. Capacity and output grew very rapidly during the early years of the conspiracy, eventually leading to excess capacity and rapidly falling prices. Certain manufacturers such as SDI, Chunghwa, LG and LPD experienced substantial gains in market share. Moreover, these firms increased capacity and output substantially relative to firms such as Sony that are not alleged to be cartel participants as well as other firms that Dr. Netz does not allege to have participated in any such agreements to restrict output.

24. Dr. Netz cites economic literature stating that "Successful cartels fashion self-imposed penalties or other compensation schemes for firms that exceed cartel quotas."[20] However, despite empirical evidence showing widespread failures to adhere to target prices, and substantial changes in CDT market shares, Dr. Netz provides very little evidence of such penalties ever being implemented and no evidence of any such "compensation schemes."[21]

25. Economists recognize that an analysis of industry characteristics can be a useful component of an economic analysis of the effects of alleged collusion. A careful and detailed *empirical* analysis of prices, quantities, market shares and other detailed data on the actual performance of the industry during the relevant time period is an essential complement. Dr. Netz notes that an analysis of industry characteristics is "of limited use in determining whether collusion has *actually* occurred in a particular industry, or whether a cartel has successfully raised prices above the competitive level,"[22] and concludes that: "Whether a cartel *succeeds* is an empirical question unresolvable by theory or industry characteristics."[23] (Emphasis added.)

A. Collusion is more difficult in dynamic industries such as the CDT industry

26. The economic literature recognizes that cartels must develop "sophisticated and flexible organizations" in order to "identify a collusive equilibrium, coordinate on it, and then continuously update as demand and costs

[19] See ¶70.

[20] Netz, Janet S., Ph.D., 15 February 2013, Rebuttal Declaration of Janet S. Netz, Ph.D., in Support of Motion of Indirect-Purchaser Plaintiffs for Class Certification, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division), (Hereinafter "Netz Class Cert Rebuttal Report"), note 99 citing Levenstein, Margaret C., and Valerie Y. Suslow, "What Determines Cartel Success?" Journal of Economic Literature, Vol. 44(1), 43-95, at 67.

[21] See also ¶101 below.

[22] "Both cartelized and competitive industries are likely to exhibit one or more characteristics that facilitate collusion and one or more characteristics that hinder collusion. Economic theory has very little to say about the relative magnitude of each effect. Furthermore, some industry characteristics, such as the presence of vertical integration, may facilitate collusion in one theoretical model, but hinder collusion in another model….Accordingly, the net effect of one or more industry characteristics on the ability of firms to collude is ambiguous, and whether or not a cartel can successfully raise prices in a specific industry is an empirical question. For these reasons, the success of the CRT cartel is an empirical question and cannot be determined solely by economic theory." Netz Class Cert Rebuttal Report, at 24.

[23] Netz Expert Report, at 129.

fluctuate."[24] Accordingly, cartel success is more difficult in dynamic industries where costs, demand, market shares and other industry characteristics are changing frequently.[25] The CDT industry experienced many such changes during the 1995 – 2007 period during which the cartel is alleged to have operated.

27. For example, it has been recognized in the economic literature that industry growth that leads to differential capacity expansion by competitors can make successful cartel coordination more difficult. A recent economic report to the European Competition Commission states:

- "The 'lumpiness' aspect of capacity building leads to pre-emption phenomena: when a market opportunity arises or simply when demand is growing, firms compete for being the first to build capacity…the capacity choice of one firm affects the market for a very long time. In this context pre-emption phenomena may be particularly acute. Indeed, when capacity decisions are fully irreversible, a firm that deviates from a collusive conduct will impose a 'fait accompli' on its competitors, who may have no choice left other than adapting themselves to this new situation."[26]

28. The economic literature also recognizes that uncertainty about such factors as changes in demand, costs, technology, and market shares over time and across firms also can make cartel coordination more difficult.[27] Such changes often affect the incentives of different firms in different ways and may also lead firms to seek changes in the terms of any coordination. They also make it more difficult for participants to detect cheating since it may not be easy to determine if one firm's gain in sales or market share is due to cheating on the terms of any collusive agreement or other factors. For example, the firm gaining share may have developed stronger technology, better service or lower costs. Alternatively, the firm may have had a strong position in the product types that happened to experience greater demand from consumers.[28] Similarly, it may be difficult to determine if a given firm's decision to offer lower prices is due to cheating or to other factors such as lower quality or reduced

[24] Levenstein, Margaret C., and Valerie Y. Suslow, 2006, What Determines Cartel Success?, Journal of Economic Literature, Vol. XLIV, 43-95, at 67.

[25] See, e.g.,

- "Second, does the industry display volatile turnover over a sustained period of time? Cartels are more likely if output and market conditions are normally stable." Grout, Paul A., & Sonderegger, S. M. I. A. (2005). *Predicting Cartels (OFT 773)*, Office of Fair Trading, at 15.
- "If a market has frequent shifts in demand, input costs, or other factors, prices in that market have to adjust often. In that case, cheating on a cartel arrangement may be difficult to detect, because it cannot be distinguished easily from other factors that cause price fluctuations. Cheating is easier to detect if prices are known." Carlton & Perloff, at 137.
- "If the probability of successful innovation is substantial, the incumbents then anticipate that their market position is short-lived (at least in expected terms); they thus put less emphasis on the cost of future retaliation and are more tempted to cheat on collusion." Marc Ivaldi, Bruno Jullien, Patrick Rey, Paul Seabright, Jean Tirole, The Economics of Tacit Collusion, IDEI, Toulouse, March 2003, at 33.
- "Bounded rationality and uncertainty may also make collusion difficult, particularly in a changing economic environment, because of increased complexity in formulating and monitoring any 'contract.' Asymmetry in costs may mean that there is no focal price on which firms can agree, resulting in 'costly haggling.'" Levenstein & Suslow (2006), at 48.

[26] Marc Ivaldi, Bruno Jullien, Patrick Rey, Paul Seabright, Jean Tirole, "The Economics of Tacit Collusion," IDEI, Toulouse, March 2003, at 60-61.

[27] "Economic theory identifies uncertainty as the primary cause of cartel instability." "Breaking Up Is Hard to Do: Determinants of Cartel Duration," Margaret C. Levenstein & Valerie Y. Suslow, April 2010, at 2. See also, Carlton & Perloff, at 135-136.

[28] For example, firms that are seeking to reduce costs through economies of scale and/or learning curve effects may prefer lower prices than other firms.

demand for its products.[29] When it is difficult to distinguish deviations from a cartel agreement from demand or supply shocks that affect relative firm performance and/or prices in a dynamic industry such as CDTs, firms also are more likely to deviate from the terms of coordination because they know that such cheating is less likely to be detected.

29. In fact, the CDT industry experienced rapid and substantial changes in supply and demand conditions over time that would tend to make effective coordination difficult and at a minimum necessitate frequent changes in any alleged collusive agreement (which in turn could make effective collusion more difficult). These changes include the following:

a. The industry experienced rapid growth in capacity, output and models during 1993 – 2000 as the demand for desktop computers grew rapidly and evolved.

   i. Consumer demand for larger and better monitors caused CDT manufacturers to make continual substantial investments.[30]

   ii. Firms such as SDI, Chunghwa and LG invested aggressively during this period to improve their technology and expand their capacity, taking substantial market share even during this period from incumbent competitors such as Hitachi, Toshiba Corp., Panasonic Corporation, and Sony.

b. Beginning in late 2000, the industry transitioned abruptly from rapid growth to rapid decline.

   i. The bust of the intense speculation surrounding "dot-com" companies sometimes called the "dot-com bubble" led to a dramatic slowing of overall technology spending in late 2000 and 2001.

   ii. LCD monitor technology began to compete with and displace CRT technology, a trend that was spurred by the popularity of laptop computers. Competition from LCDs was a significant additional constraint on CRT pricing that increased substantially over time.[31]

c. Substantial and often rapid declines in prices that varied significantly over time and across different sizes and types of CDTs;[32]

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[29] As discussed below, differences in product quality and other aspects of products across manufacturers led to disputes among the CDT manufacturers.

[30] For example, one article stated: "Distributors said 15-inch monitors already are in short supply, yet the demand continues to skyrocket. The 15-inch and 17-inch models are replacing 14-inch screens as the standard, and their popularity is expected to grow with the planned August release of Microsoft Corp.'s Windows 95." Pereira, Pedro, "Higher monitor prices looming -- Shortages of cathode ray tubes, higher production costs in Japan taking a toll," *Computer Reseller News*, 10 April 1995. http://global.factiva.com (accessed 27 July 2014). See also Section III.A below.

[31] Dr. Netz argues that LCD competition did not constrain CRT prices. Netz Expert Report, at 35-41. However, this is inconsistent with the fact that she includes an LCD variable in her CRT overcharge regressions. The actual significance of LCD competition also is consistent with the fact that CDT prices declined earlier and more rapidly than CPT prices, consistent with the earlier and greater penetration of LCDs into computer monitors relative to televisions. See Figure 1 above. Dr. Netz also argues that competition from LCD monitors was not an effective constraint on the prices of CRTs and CRT monitors because LCD products were priced substantially higher than CRT products. Netz Expert Report, at 35-41. However, the fact that there may be significant price differences between two products does not mean that consumers will not substitute from one to the other if relative prices change.

d. Continued substantial changes in market shares as some firms continued to invest in technology, plant and production and other firms began to decline and/or exit;[33]

e. Substantial changes occurred in the geographic location of both CDT supply and demand.

i. Continual efforts to move production to lower cost regions led to continual changes in the relative cost positions of existing competitors as well as the growth of some competitors and the decline and/or exit of others;[34]

ii. Rapid growth of emerging economies as consumers of CDTs.[35]

B. Collusion is more difficult when there are substantial differences in important characteristics across competitors.

30. The economic literature also recognizes that substantial differences among competitors can make collusion more difficult.[36] When firms differ substantially, it is more difficult to reach agreement on the terms of coordination. In addition, firms with better technology, lower costs, or more excess capacity, among other factors will have greater incentives to expand output and/or "cheat" on any collusive agreement than their less efficient and/or less aggressive rivals.

31. CDT manufacturers exhibited substantial differences in terms of several characteristics that make collusion more difficult. As discussed in more detail below, these characteristics included the following (among others):

- Commitment to an aggressive or expansive CDT growth strategy;
- Quality of technology;[37]

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[32] See Figure 13 and hedonic price analysis in Section III.B below.

[33] The economic literature recognizes that collusion can be more difficult in a declining industry such as the CDT industry was after 2001. When the future of the industry is uncertain and demand is expected to be lower in the future, firms have an incentive to compete more aggressively for share today. See Marc Ivaldi, Bruno Jullien, Patrick Rey, Paul Seabright, and Jean Tirole, "The Economics of Tacit Collusion," IDEI, Toulouse March 2003. The same is true for an individual firm that expects that it will be exiting the industry. See Margaret C. Levenstein and Valerie Y. Suslow (2010), "Breaking Up Is Hard to Do: Determinants of Cartel Duration," *Journal of Law and Economics*, at 6.

[34] See Section III. C below. Figure 26 below shows the rapid growth of China as a CDT manufacturing country.

[35] See, e.g. Netz Expert Report, Exhibit 46.

[36] See, e.g.,

- "The presence of such cost asymmetry has several implications. First, firms may find it difficult to agree to a common pricing policy. Indeed, firms with a lower marginal cost will insist in lower prices than what the other firms would wish to sustain. More generally, the diversity of cost structures may rule out any 'focal point' in pricing policies and so exacerbate coordination problems. In addition, technical efficiency would require allocating market share to low-cost firms, but this would clearly be difficult to sustain in the absence of explicit agreements and side-transfers. Second, even if firms agree on a given collusive price, low-cost firms will again be more difficult to discipline, both because they might gain more from undercutting their rivals and because they have less to fear from a possible retaliation from high-cost firms." Marc Ivaldi, Bruno Jullien, Patrick Rey, Paul Seabright, and Jean Tirole, "The Economics of Tacit Collusion," IDEI, Toulouse March 2003, at 35-36.
- "Asymmetry in costs may mean that there is no focal price on which firms can agree, resulting in 'costly haggling.'" Levenstein & Suslow (2006), at 48.

[37] See, e.g.,

- Cost of production;[38]
- Supply Elasticity / Production line flexibility.[39]
- Degree of vertical integration;
- Participation in the supply of competing products such as LCDs.

32. CDT manufacturers differed significantly in their commitment to an aggressive CDT growth strategy. In the early years of the alleged conspiracy period some firms such as SDI, Chunghwa and LG were committed to rapid growth and gains in market share. They invested heavily in both improving their technology and expanding their capacity.[40] The differences in perceived strategies across manufacturers are evident in produced documents. One Chunghwa document stated "With its full size, production capacity expansion and global supply advantages, Samsung ambitiously wants to expand its territory. It will definitely grab strategic customers like *ACER*, *PHILIPS*, $60.00 (*S/S*), also *offer* $62.00(*S/S*) to the medium customers. Have impact on CPT's order." [41]

33. An internal Philips document indicates that different defendants responded in quite different ways to the buildup of excess capacity in the industry in the years after 1996. Some firms, such as SDI and Chunghwa, were perceived as continuing to focus on rapid growth despite industry-wide excess capacity and reduced profitability.[42] However, other firms were perceived to be "throttling back" their growth plans in the face of falling prices and overcapacity. The same document stated that there were yet other differentiated strategies pursued by firms: "Japanese players, with the exception of Matsushita [Panasonic Corporation] and Sony have continued to consolidate their CRT activities. They remain focused on the higher end of the markets and are trying to maintain a competitive advantage by introducing innovative products early. The strategic thrust of the Japanese players however is directed towards new display technologies such as LCD and LFD."[43]

- Mr. Song mentioned that differences between the manufacturers led to different discussions during the meetings; he states that "LP or Chunghwa had a great gap in terms of the technology and other aspect[s] compared to us." 13 December 2012, Deposition of In Hwan Song, Volume 2, at 191:12-14.
- "Toshiba has the potential to capitalize on proprietary MNN, MF, RAC, UHC and Flat face technology. In order to do this, technology improvements must continue to be promoted and available to the PC and OEM markets before or at the same time as competitor's products." TAEC-CRT-00065220, at 34. See also footnotes 40, 43, and 47.

[38] See also footnotes 37, 47, 48 and 194. In addition to the evidence cited below, the differential timing of CDT firms' exits from the industry provides further evidence of their varying cost structures.

[39] See also footnotes 41, 49-50 below.

[40] See, e.g.,

- LPD-NL00018267 – LPD-NL00018336, at 8278.
- A 1999 TAEC document stated: "PC companies and OEMs are no longer willing to pay a premium for MF or other technological advances. …TSB is introducing new CDT technologies at a slower pace. Koreans have closed the technology gap." TAEC-CRT-00065220, at 27.
- See also, SDCRT-0203634 - SDCRT-0203664, at SDCRT-0203646, SDCRT-0203664, and footnotes 41 and 50 for large share gains by these firms.

[41] 24 February 1997, CHU00028763 - CHU00028767, at 8763.01E. See also: "Mr. Moon [Orion] claimed that he believed that SDD had strong ambitions to expand M/S, and that its major strategy is to 'kill the competing makers'. So he was suspicious about SDD's attitude toward holding prices." 18 May 1998, CHU00028952 – CHU00028954, at 8954E. See also Sections III.B and III.C below.

[42] LPD-NL00018267 – LPD-NL00018336, at 8278-8280. Similarly, an LPD document states that "LPD set itself the target to increase its market share in four years time from about 26% to 30%..." A.A.M. Deterink, Investigation of the Causes of the Bankruptcy of LG.Philips Displays, 20 April 2009, at 27.

[43] LPD-NL00018267 – LPD-NL00018336, at 8278.

34. Economists also have noted that varying degrees of vertical integration among competitors can complicate the effective functioning of a cartel. For example, one study states that: "If some firms are vertically integrated … it may be difficult for the cartel to determine at what point in the distribution chain cheating occurs. In contrast, if all firms sell to the same type of customer (for example, at the retail level), cheating is easier to detect."[44] The extent of vertical integration did, in fact, vary significantly across CDT manufacturers.[45] In addition, there is evidence that some CDT manufacturers saw the presence of vertical integration as an important point of competitive differentiation across manufacturers.[46]

35. Moreover, the many differences across CDT manufacturers were not static, but changed over time as firms made different levels of investments to improve their technology, expand their production capacity or to lower their costs. For example, the relative technology and cost positions of CDT manufacturers changed over time based on factors such as:

- The magnitude of the investments each manufacturer made in its products and technology;[47]
- The extent to which individual manufacturers relocated production facilities from higher cost countries to lower cost countries;[48]
- The extent to which individual manufacturers had "excess capacity" or the ability to expand output significantly over a short period of time[49] and the extent to which such "excess" capacity

[44] Carlton and Perloff (2005), at 139.

[45] The following defendants, for example, have corporate affiliates that also manufactured CRTs and products containing CRTs: Hitachi, LG (prior to July 2001), Philips (prior to July 2001), Panasonic Corporation (until December 2000 when it exited the CDT business and until 2003 when it exited the CPT business), and Toshiba Corp. (prior to April 2003). Chunghwa, LPD (starting in July 2001), and SDI did not.

[46] For example, a FY2001 Budget Analysis from TAEC indicated that one of the significant challenges facing their CDT business was the fact that they were "competing against OEM monitor makers who are vertically integrated." TAEC-CRT-00083305.

[47] See, e.g.,

- "The Company achieves its cost competitiveness through innovation activities, by having a flexible production system, with constant improvements in process technology, and by pursuing an efficient system of purchasing and outsourcing. The company's productivity of CPTs . . . is believed to be the highest in the world . . . In addition, the Company also ranks highest in the world in terms of total process yield for CRTs. Therefore, despite price erosion, increased labor and raw material costs and increased competition over the past few years, the company has succeeded in maintaining its cost competitiveness while capturing additional market share." 22 May 2001, EIN0017699 - EIN0018075, at 7711.
- "The CRT industry was characterised by a predominant focus on cost reduction, fierce competition, decreasing sales and constant consolidation." A.A.M. Deterink, Investigation of the Causes of the Bankruptcy of LG.Philips Displays, 20 April 2009, at 93. See also footnotes 37-38.

[48] See, e.g. LPD: "Although management and supervisors have annually restructured, a much more rapid closure of the factories in the high-wage countries (in particular former Philips factories in Europe) would – in retrospect – have been appropriate. This is all the more persuasive given that in the annual report of 2001 it was already stated that, in connection with the need to produce at as low costs as possible, rapid migration was needed to production countries with lower costs." A.A.M. Deterink, Investigation of the Causes of the Bankruptcy of LG.Philips Displays, 20 April 2009, at 20.

[49] Dr. Netz argues that "Adding capacity to an existing plant was also expensive. In addition, CRT manufacturing required substantial ongoing investments in capital." … "Building a plant or adding a line also took a lot of time. Constructing the plant or line can take a year and require an additional year to get the completed line up to mass production. For a line to reach full efficiency might take a further year or more of mass production." … "On top of the time and capital required, there is substantial risk involved in establishing a new CRT facility or line. Despite CRT manufacturing being a mature

> was of a kind for which product demand was high at a given time –e.g. excess capacity for making 14" curved CDTs does not help if the market is demanding 17" flat CDTs because the excess capacity for making 14" curved CDTs would have to be converted to 17" flat CDTs, which takes time and expense.[50]

36. An example of firm asymmetry raising the costs of coordination is provided by disputes among the CDT manufacturers regarding whether manufacturers with lower quality products should be able to sell at lower prices than their competitors, and if so, what any such differential should be at different points in time. For example, there appear to have been numerous disputes between Chunghwa and other manufacturers in which CPT argued that it needed to be able to charge lower prices than other manufacturers to compensate for the lower quality of its product(s).[51] Moreover, evidence suggests that this disputed differential was not static but changed over time.[52] Similarly, LG complained that it was weaker than SDI and Chunghwa and should be able to charge lower prices.[53]

37. Another potential source of conflicting incentives among the defendants relates to the fact that some of the defendant manufacturers such as Chunghwa and Hitachi also produced LCDs and products containing LCDs. Since LCDs provided substitutes for CDTs or CPTs, this would potentially give these firms different incentives with respect to capacity investments and CDT (or CPT) prices. For example, firms that made large investments in LCD capacity might be less willing to invest in additional CDT or CPT capacity and may also prefer higher prices for these products.

38. The relatively large number of firms in the CDT industry and the relatively low concentration, particularly in the early years of the alleged conspiracy, also would have complicated efforts at coordination. For example, between 1996 and 2000, the HHI index of global CDT production concentration was less than 1500,[54] a range that the Horizontal Merger Guidelines of the U.S. Department of Justice and the Federal Trade Commission considers to be "unconcentrated."[55]

39. These important differences across CDT manufacturers are reflected in the data on manufacturers' shares for particular sizes of CDTs and the changes in those shares over time. For example, as shown in Table 1, as of 1998, firms such as Chunghwa, SDI and LGE were strong in the smaller sizes of CDTs, while Japanese

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technology, manufacturers sometimes were unable to develop economical production on a given line or of a given product." Netz Expert Report, at 14-16.

[50] The idiosyncratic factors that can affect a firm's ability to expand production from a given CDT facility are illustrated by some of Dr. Netz's examples of the operational risks of CDT production. For example, Dr. Netz Expert Reports that "Philips established a plant in Nanjing, China, with an initial investment of $100 million. The plant installed five production lines in two stages, three lines in the third quarter of 2000 and two more in the third quarter of 2001. However, the factory had problems attaining either adequate run rates or quality. By July 2002, LG Philips expected it might cost another $15 million to $25 million to revise the equipment, modify product designs, and correct operating processes." Netz Expert Report, at 16, citing L.G. Philips Displays Holding B.V., Undated, Minutes of the Supervisory Board Meeting of LG.Philips Displays Holding B.V., PHLP-CRT-002306 - PHLP-CRT-002481, at 2339.

[51] See, e.g., CHU00028763 - CHU00028767, at 8764E.

[52] 24 February 1997, CHU00028763 - CHU00028767 at 8764E.

[53] SDCRT-0086662 - SDCRT-0086664, at 6662E.

[54] Production share data are obtained from SDCRT-0201291. Calculation of CDT shares and HHIs are provided in my backup file "a003_pdn_mfg_shares.xlsx."

[55] U.S. Department of Justice and the Federal Trade Commission, *Horizontal Merger Guidelines* (2010): §5.3. CDT industry concentration began to increase after 2000 as the declining demand and low profitability of the industry led to substantial exit.

manufacturers such as Hitachi, Sony, Toshiba Corp. and Panasonic Corporation were technology leaders with relatively large shares in the larger 17 and 19 inch sizes at this time.

Table 1

1998 CDT Production Shares by Manufacturer and Size (Top 4 Manufacturers for Each Size Group)

Size	Manufacturer	Share
14"	Chunghwa	31%
	SDI	30%
	Daewoo	17%
	Philips	11%
15"	Chunghwa	23%
	SDI	21%
	LG	17%
	Philips	14%
17"	SDI	17%
	Hitachi	14%
	Sony	12%
	Toshiba	10%
19"	Hitachi	56%
	Sony	11%
	SDI	10%
	Panasonic Corp.	10%
21"	Sony	42%
	Hitachi	28%
	Mitsubishi	17%
	Panasonic Corp.	13%

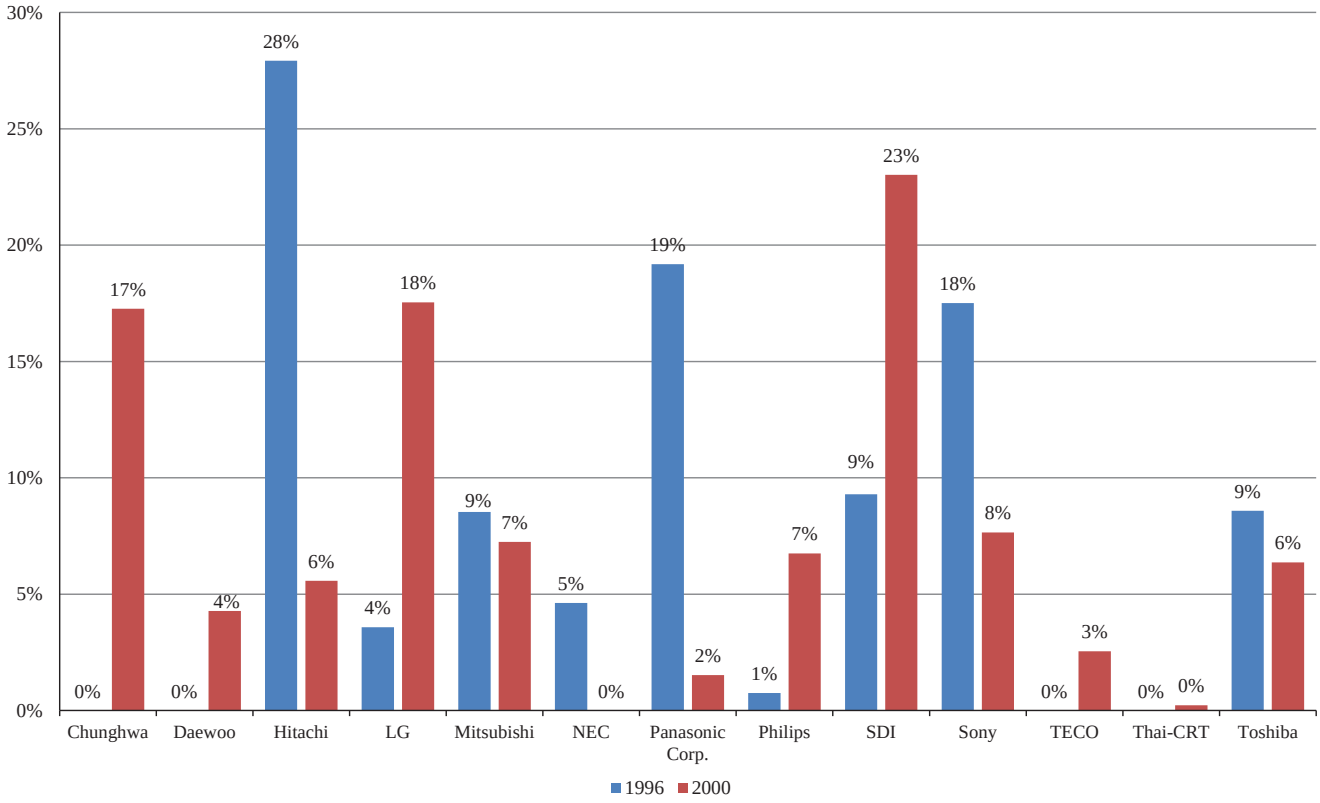
Note(s): Data source combines LG and Philips under the heading of "LPD."
Data source inappropriately labels Panasonic Corp. as Matsushita.
Because LPD was not formed until July 2001, LG, Philips, and LPD are separated for the purposes of this chart.
For periods before the July 2001 LPD formation, "LPD" separated into "LG" (Korea) & "Philips" (Taiwan).
Data source(s): SDCRT-0201291.
Source file(s): SDCRT-0201291.dta; vendor_map.xlsx; p003_pdn_mfg_shares.do; a003_pdn_mfg_shares.xlsx

40. In terms of changes in shares, Figures 2-6 show that firms such as SDI, LGE and Chunghwa substantially increased their industry shares from 1996 to 2000 -- at the expense of Hitachi, Panasonic Corporation and Sony

particularly. These substantial changes in share could only come from substantial improvements in the technology of SDI, LGE and Chunghwa for making larger CDTs and the large investments in capacity during this time period that represents the beginning of the alleged cartel. The following graphics depict changes in shares for 15 and 17 inch monitors between the two time periods.[56] The first graphic shows share levels by manufacturer in each period, and the second shows the percentage point change in share with the same listing of manufacturers. Figure 6 shows the change in share over this period across all monitor sizes for manufacturers. For example, looking at 17 inch CDTs in Figure 3 shows that SDI and LG gained 14 percentage points of share, and Chunghwa gained 17 percentage points. These gains largely came at the expense of Hitachi (-22%), Panasonic Corporation (-18%) and Sony (-10%). Similar results are shown for 15 inch CDTs in Figure 5.[57]

Figure 2

17-Inch CDT Annual Production Shares by Manufacturer



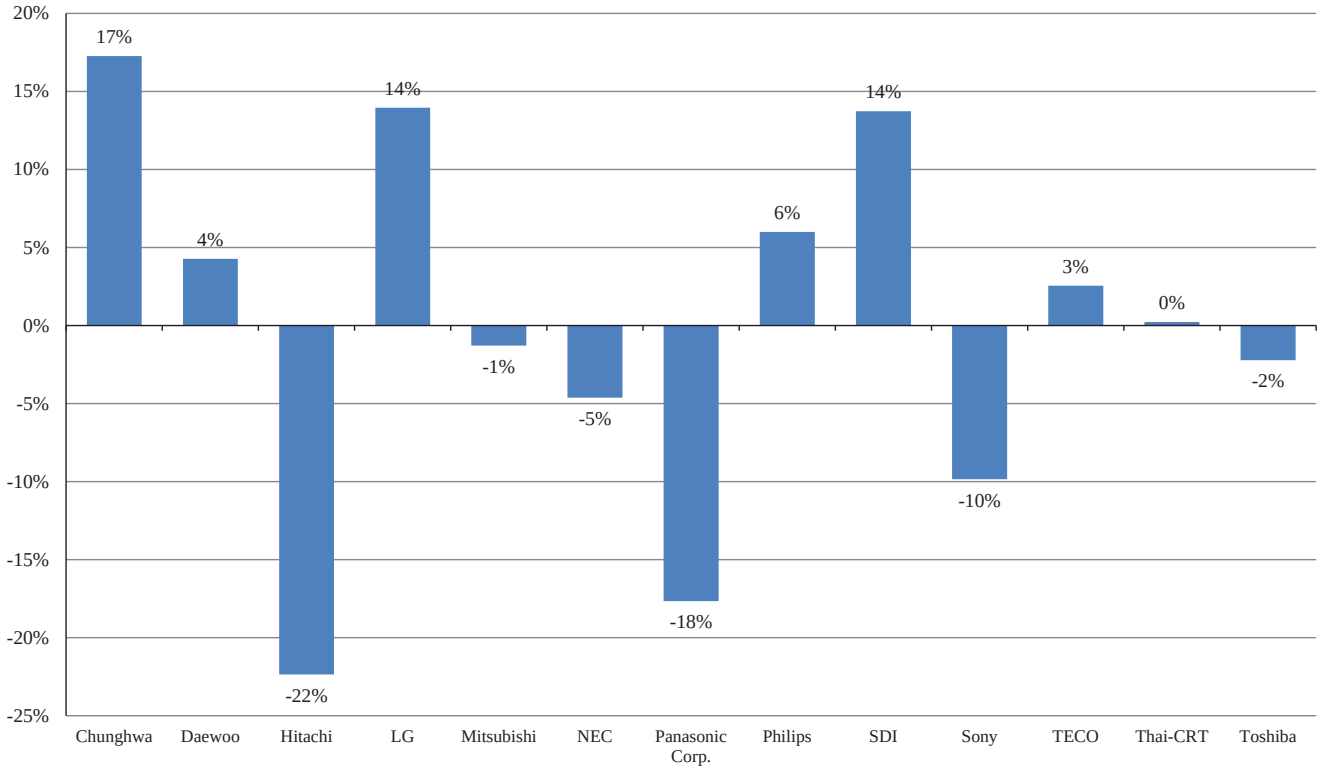
Note(s): Data source combines LG and Philips under the heading of "LPD." Because LPD was not formed until July 2001, LG, Philips, and LPD are separated for the purposes of this chart. For periods before the July 2001 LPD formation, "LPD" separated into "LG" (Korea) & "Philips" (Taiwan). Data source inappropriately labels Panasonic Corp. as Matsushita.
Data Source(s): SDCRT-0201291.
Source File(s): SDCRT-0201291.dta; vendor_map.xlsx; p003_pdn_mfg_shares.do; a003_pdn_mfg_shares.xlsx

[56] I am not aware of any comprehensive source of CDT production data for the entire relevant time period. Figures 2-6 are based on estimated production data compiled from internal CDT manufacturer documents. This is the same data that Dr. Netz used in her Exhibits 4 (Worldwide CDT Production Shares), 7 (HHI Over Time, Cartelized CDT Production vs. Non-Cartelized CDT Production), 9 (Total Worldwide CRT Production by Tube Type). It is also the same data that DAP plaintiff's expert Dr. Elzinga used in calculating market shares in his Exhibit 3 (Share of Worldwide CDT Volume). See also SDCRT-0203634 - SDCRT-0203664.

[57] All market share calculations are provided in my backup file "a003_pdn_mfg_shares.xlsx."

Figure 3

Change in 17-Inch CDT Annual Production Shares by Manufacturer (1996-2000)



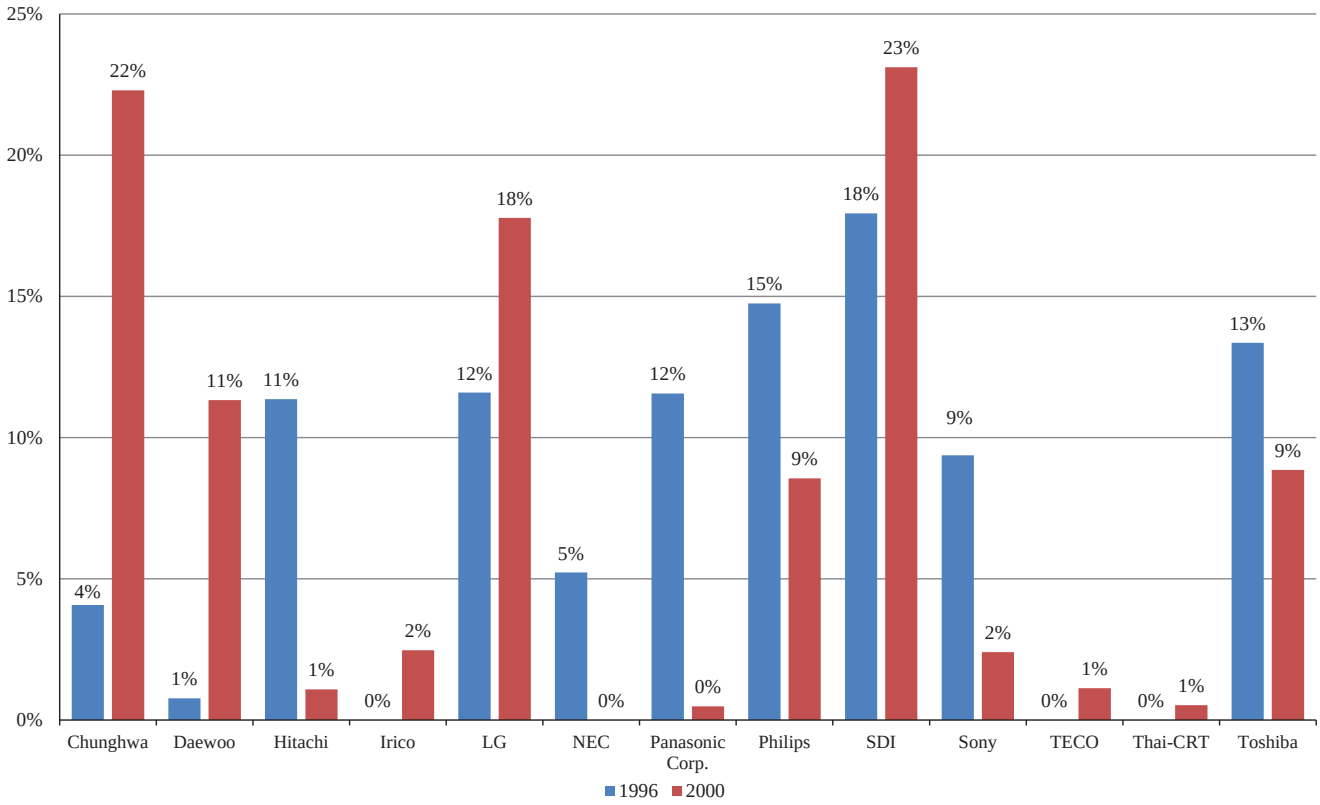
Note(s): Data source combines LG and Philips under the heading of "LPD." Because LPD was not formed until July 2001, LG, Philips, and LPD are separated for the purposes of this chart. For periods before the July 2001 LPD formation, "LPD" separated into "LG" (Korea) & "Philips" (Taiwan). Change in shares calculated as difference between 2000 and 1996 shares. Data source inappropriately labels Panasonic Corp. as Matsushita.

Data Source(s): SDCRT-0201291.

Source File(s): SDCRT-0201291.dta; vendor_map.xlsx; p003_pdn_mfg_shares.do; a003_pdn_mfg_shares.xlsx

Figure 4

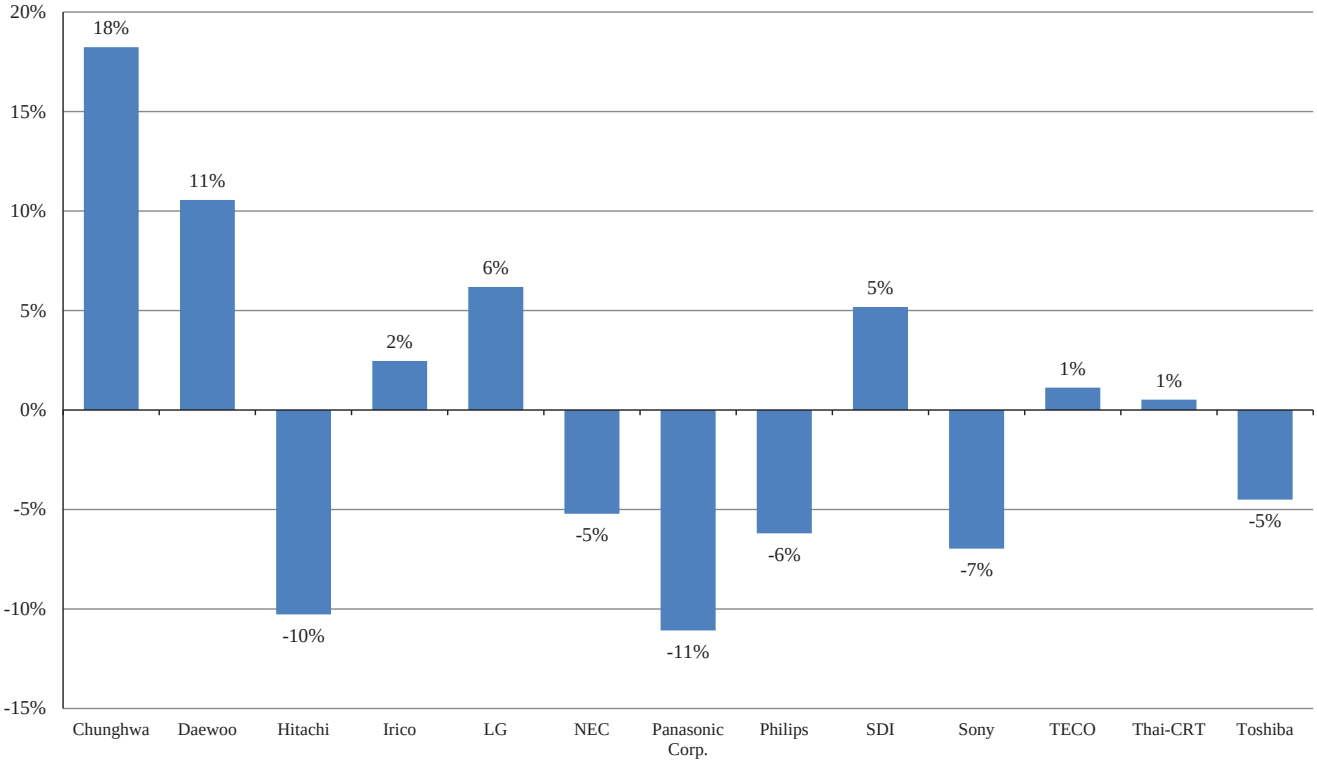
15-Inch CDT Annual Production Shares by Manufacturer



Note(s): Data source combines LG and Philips under the heading of "LPD." Because LPD was not formed until July 2001, LG, Philips, and LPD are separated for the purposes of this chart.
For periods before the July 2001 LPD formation, "LPD" separated into "LG" (Korea) & "Philips" (Taiwan).
Data source inappropriately labels Panasonic Corp. as Matsushita.
Data Source(s): SDCRT-0201291.
Source File(s): SDCRT-0201291.dta; vendor_map.xlsx; p003_pdn_mfg_shares.do; a003_pdn_mfg_shares.xlsx

Figure 5

Change in 15-Inch CDT Annual Production Shares by Manufacturer (1996-2000)



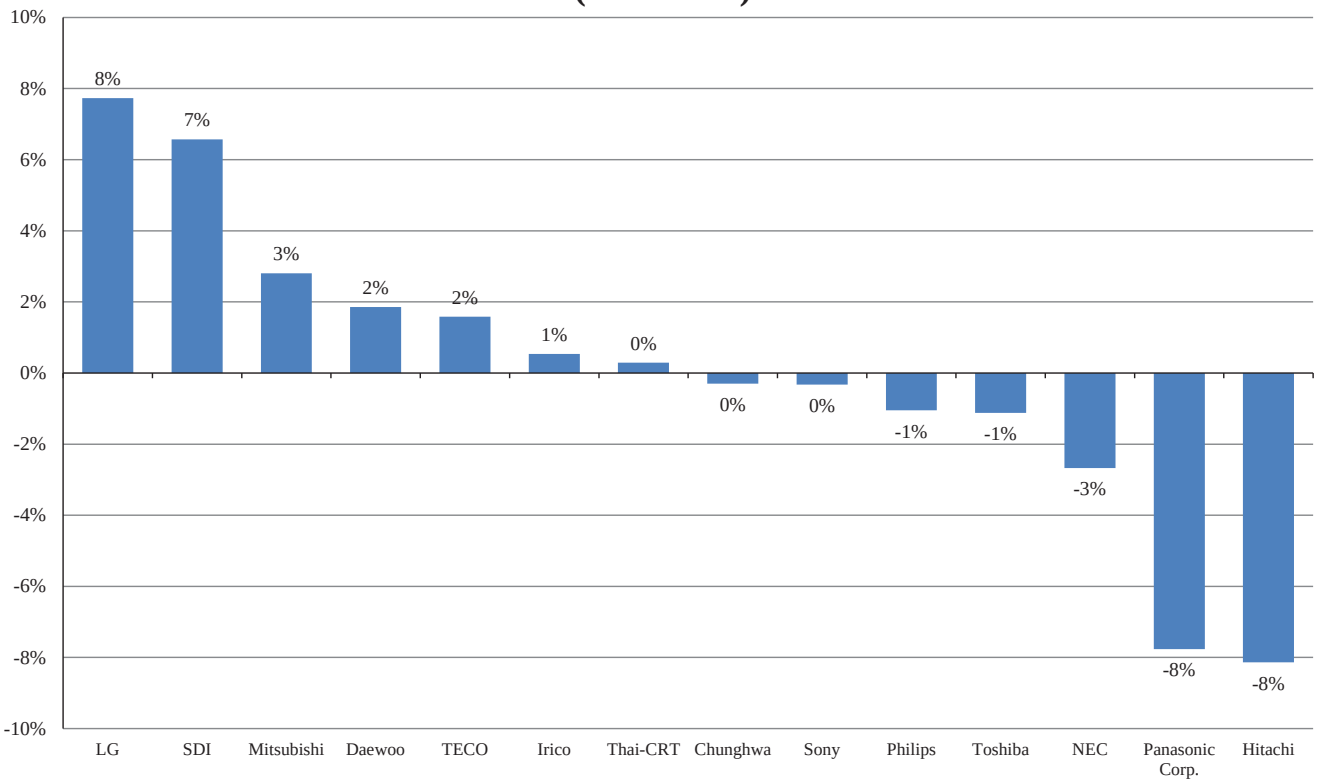
Note(s): Data source combines LG and Philips under the heading of "LPD." Because LPD was not formed until July 2001, LG, Philips, and LPD are separated for the purposes of this chart. For periods before the July 2001 LPD formation, "LPD" separated into "LG" (Korea) & "Philips" (Taiwan). Change in shares calculated as difference between 2000 and 1996 shares. Data source inappropriately labels Panasonic Corp. as Matsushita.

Data Source(s): SDCRT-0201291.

Source File(s): SDCRT-0201291.dta; vendor_map.xlsx; p003_pdn_mfg_shares.do; a003_pdn_mfg_shares.xlsx

Figure 6

Change in CDT Annual Production Shares by Manufacturer (1996-2000)



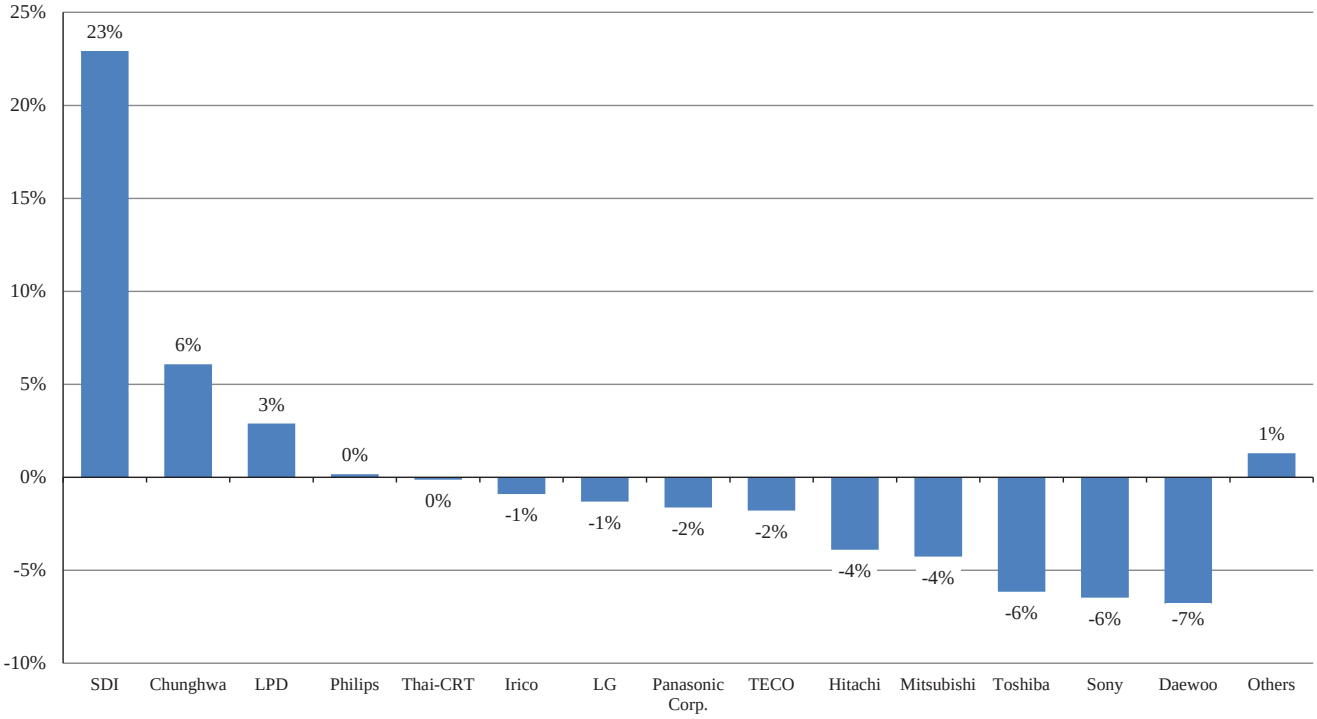
Note(s): Data source combines LG and Philips under the heading of "LPD." Because LPD was not formed until July 2001, LG, Philips, and LPD are separated for the purposes of this chart. For periods before the July 2001 LPD formation, "LPD" separated into "LG" (Korea) & "Philips" (Taiwan). Change in shares calculated as difference between 2000 and 1996 shares. Data source inappropriately labels Panasonic Corp. as Matsushita.

Data Source(s): SDCRT-0201291.

Source File(s): SDCRT-0201291.dta; vendor_map.xlsx; p003_pdn_mfg_shares.do; a003_pdn_mfg_shares.xlsx

Figure 7

Change in CDT Quarterly Production Shares from 2000Q1 to 2006Q4



Note(s): Data source combines LG and Philips under the heading of "LPD."
Because LPD was not formed until July 2001, LG, Philips, and LPD are separated for the purposes of this chart.
For periods before the July 2001 LPD formation, "LPD" separated into "LG" (Korea) & "Philips" (Taiwan).
Change in shares calculated as difference between 2006Q4 and 2000Q1 shares unless noted otherwise below.
Change in LG shares and Philips shares calculated as difference between 2000Q1 and 2001Q2 shares.
Because LPD was not formed until 2001Q3 out of combination of LG and Philips, the change in LPD share calculated relative to LG and Philips' combined 2001Q2 share.
Hitachi's change in CDT quarterly production share only represents 2000Q1 through 2001Q4, as the Hitachi Defendants ceased manufacturing CDTs in December 2001.

Data Source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibit 82.

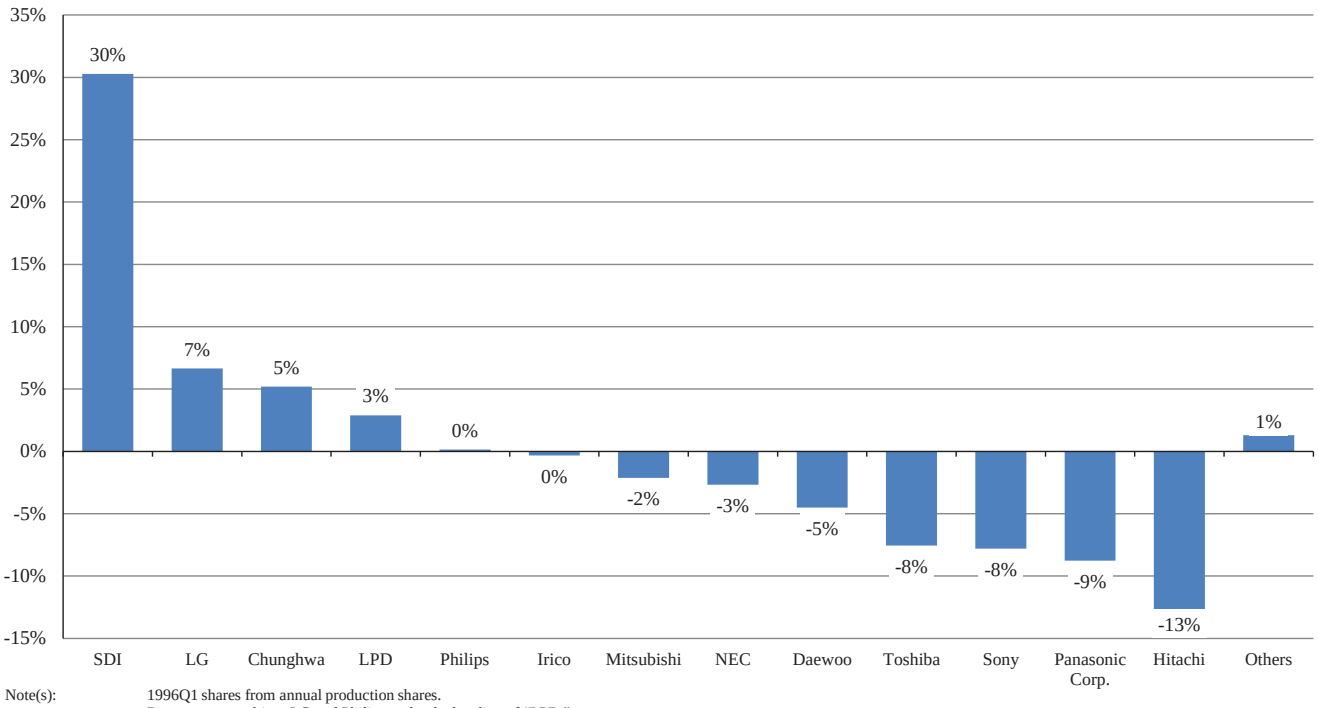
Source File(s): total production.do; HDP-CRT00019322_rough_translation.xls; SDCRT-0201291.dta; chu00071226.dta; mtpd-0416090.dta; CDT data.xlsx; vendor_map.do; vendor_map.xlsx; vendor_map_def.dta; vendor_map_name.dta; p004_pdn_mfg_shares_2006.do; a004_pdn_mfg_shares_2006.xlsx

41. These substantial changes in share continued beyond 1996-2000 and extended over the entire period for which data are available. Importantly, during a period of substantial decline in demand which was evidenced by excess capacity by 2000, some competitors increased their shares significantly while others faced significant reductions, and even exit. For example, Figure 7 shows that during the period from 2000Q1 to 2006Q4 SDI increased its share by 23 percentage points while Chunghwa gained roughly 6 percentage points. LPD's share fluctuated significantly over this period, ending up with a gain of approximately 3 percentage points. The gains experienced by these firms came largely at the expense of Hitachi, Mitsubishi, Daewoo, Toshiba Corp. and Sony, each of whom lost between four and seven percentage points of market share during this period. Several of these firms actually exited the CDT industry during this period.[58]

[58] It is my understanding that the Hitachi Defendants ceased manufacturing CDTs by December 2001 and CPTs by April 2002, and ceased selling CDTs by October 2002 and CPTs by March 2003. It is also my understanding that Panasonic Corporation stopped manufacturing CDTs in 2000 and had exited the CDT business by 2001. Deposition of Allen Chang, 12 March 2014, Volume 1, at 35:25-36:15. A 2004 LPD document stated: "Over the past two years, competitors in CDTs have been ceasing their CDT production, including Matsushita, Hitachi, Toshiba, Sony and Teco. Mitsubishi has announced that it will cease CDT production in 2004. Orion is understood to be having financial difficulties and has reduced its production lines from 3 to 1." LPD-NL00173522 – LPD-NL00173655, at 3588.

Figure 8

Change in CDT Quarterly Production Shares from 1996Q1 to 2006Q4



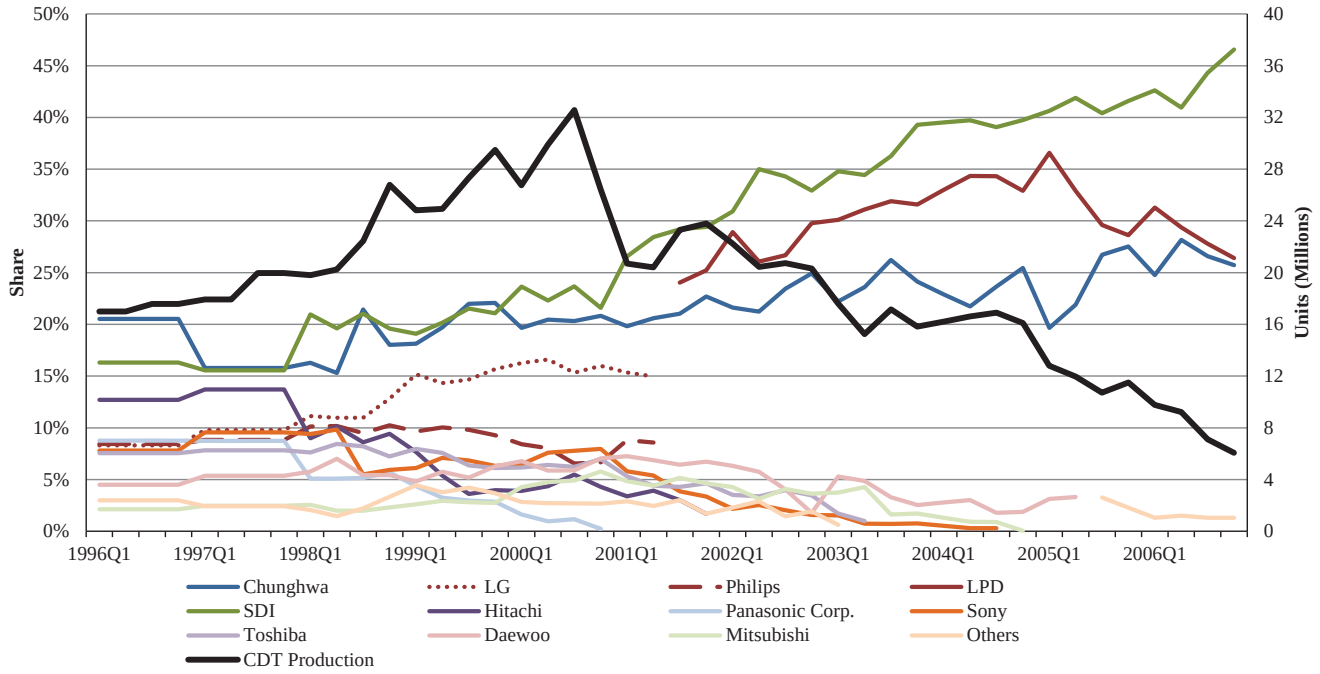
Note(s): 1996Q1 shares from annual production shares.
Data source combines LG and Philips under the heading of "LPD."
Because LPD was not formed until July 2001, LG, Philips, and LPD are separated for the purposes of this chart.
For periods before the July 2001 LPD formation, "LPD" separated into "LG" (Korea) & "Philips" (Taiwan).
Change in shares calculated as difference between 2006Q4 and 1996Q1 shares unless noted otherwise below.
Change in LG shares and Philips shares calculated as difference between 1996Q1 and 2001Q2 shares.
Because LPD was not formed until 2001Q3 out of combination of LG and Philips, the change in LPD share calculated relative to LG and Philips' combined 2001Q2 share.
Hitachi's change in CDT quarterly production share only represents 1996Q1 through 2001Q4, as the Hitachi Defendants ceased manufacturing CDTs in December 2001.
Data Source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibit 82.
Source File(s): total production.do; HDP-CRT00019322_rough_translation.xls; SDCRT-0201291.dta; chu00071226.dta; mtpd-0416090.dta; CDT data.xlsx; vendor_map.do; vendor_map.xlsx; vendor_map_def.dta; vendor_map_name.dta; p004_pdn_mfg_shares_2006.do; a004_pdn_mfg_shares_2006.xlsx

42. If we look at the entire 1996Q1 to 2006Q4 time period as a whole, we see that SDI had the largest share gain with 30 percentage points followed by LG at seven percentage points and Chunghwa at five percentage points. The largest share losers were Hitachi at -13% Pansonic Corporation at -9% and Sony and Toshiba Corp. at -8% (Figures 8-9). These share changes are consistent with the testimony of Mr. Chu of SDI who stated: "First of all, we had to expand our company's market share. Second, we had to kill the competitors no matter who they were. So we stuck to those two principals. So in the end, LPD died out. All our CRT competitors have fallen before us. So what we did was try to eliminate all our competitors and become the last winner to survive in the end."[59]

[59] Deposition of Hun Sul Chu, 11 February 2014, Volume 2, at 284:6-11.

Figure 9

CDT Quarterly Production Shares and Total Industry Production (1996Q1-2006Q4)



Note(s): 1996 and 1997 quarterly shares from annual production shares.
Data source combines LG and Philips under the heading of "LPD."
Because LPD was not formed until July 2001, LG, Philips, and LPD are separated for the purposes of this chart.
For periods before the July 2001 LPD formation, "LPD" separated into "LG" (Korea) & "Philips" (Taiwan).
2001 Q1 and 2001 Q2 "LPD" production shares split into "LG" and "Philips" according to relative production volumes of LG and Philips for the first half of 2001.
Manufacturer production data for 2004Q1 unavailable. 2004Q1 production calculated as the average of 2003Q4 and 2004Q2 production.
Plaintiffs' dataset inappropriately labels Panasonic Corp. as MTPD.

Data Source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibit 82.

Source File(s): total production.do; total production.xlsx; HDP-CRT00019322_rough_translation.xls; SDCRT-0201291.dta; CHU00071226.XLS; chu00071226.dta; mtpd-0416090.dta; vendor_map.do; vendor_map.xlsx; vendor_map_def.dta; vendor_map_name.dta; CDT data.xlsx; p004_pdn_mfg_shares_2006.do; a004_pdn_mfg_shares_2006.xlsx

43. As discussed in more detail in Section III, the significant changes in CDT market shares make it less likely that effective collusion occurred for several reasons. Most obviously, Dr. Netz alleges that the defendant manufacturers engaged in a variety of mechanisms to restrict output including allocations of market share and individual large customers. From an economic perspective, the goal of these alleged mechanisms would be to "share" the economic costs and benefits of collusion relatively equally among the participating manufacturers and prevent individual manufacturers from cheating on the agreements by increasing their sales at the expense of other manufacturers. Substantial share changes indicate that these objectives were not realized.[60] In addition, changing shares make it more difficult for cartel members to determine whether one or more firms are cheating on a price fixing agreement or have experienced increased sales for some other reason.

[60] Dr. Netz argues that substantial share changes can be consistent with collusion, in principle. However, for the reasons discussed in Section III.D, I do not believe her arguments in this regard are persuasive in this case.

C. Collusion is more difficult when products are heterogeneous and prices are difficult to observe and monitor.

44. Economists recognize that collusion is more difficult when products are differentiated and heterogeneous and prices are difficult to observe and monitor.[61] CDTs are differentiated products with varied characteristics and opaque or differentiated prices. Dr. Netz identifies a number of product characteristics such as finish (whether the tube shipped without or with the deflection yoke and related components installed), size, shape, resolution, frequency, safety standards, mask type, and neck diameter. Similarly, one industry publication from Stanford Resources, Inc. routinely tracked a variety of different characteristics of CDT monitors over time including application, diagonal screen size, profile type, resolution, and pixel format.[62]

45. The large number of different CDT products during the class period and the high degree of product heterogeneity is illustrated in Figure 10 and Appendix C which summaries the number of unique models in each quarter for each of the major CDT size categories along with summary information on the range of prices for each size category. Many quarters have more than 200 different models for a specific CDT size category. The relative importance of major size categories varies as does mix per manufacturer. In addition, most categories exhibit wide price dispersion as measured by the difference between the 95th and 5th percentile prices as a percentage of the overall average price. Moreover, this variation across products changes over time as new models are introduced, old models are phased out, and prices change.[63] All of this heterogeneity would complicate attempts to "fix" CDT prices.

[61] See, e.g.,

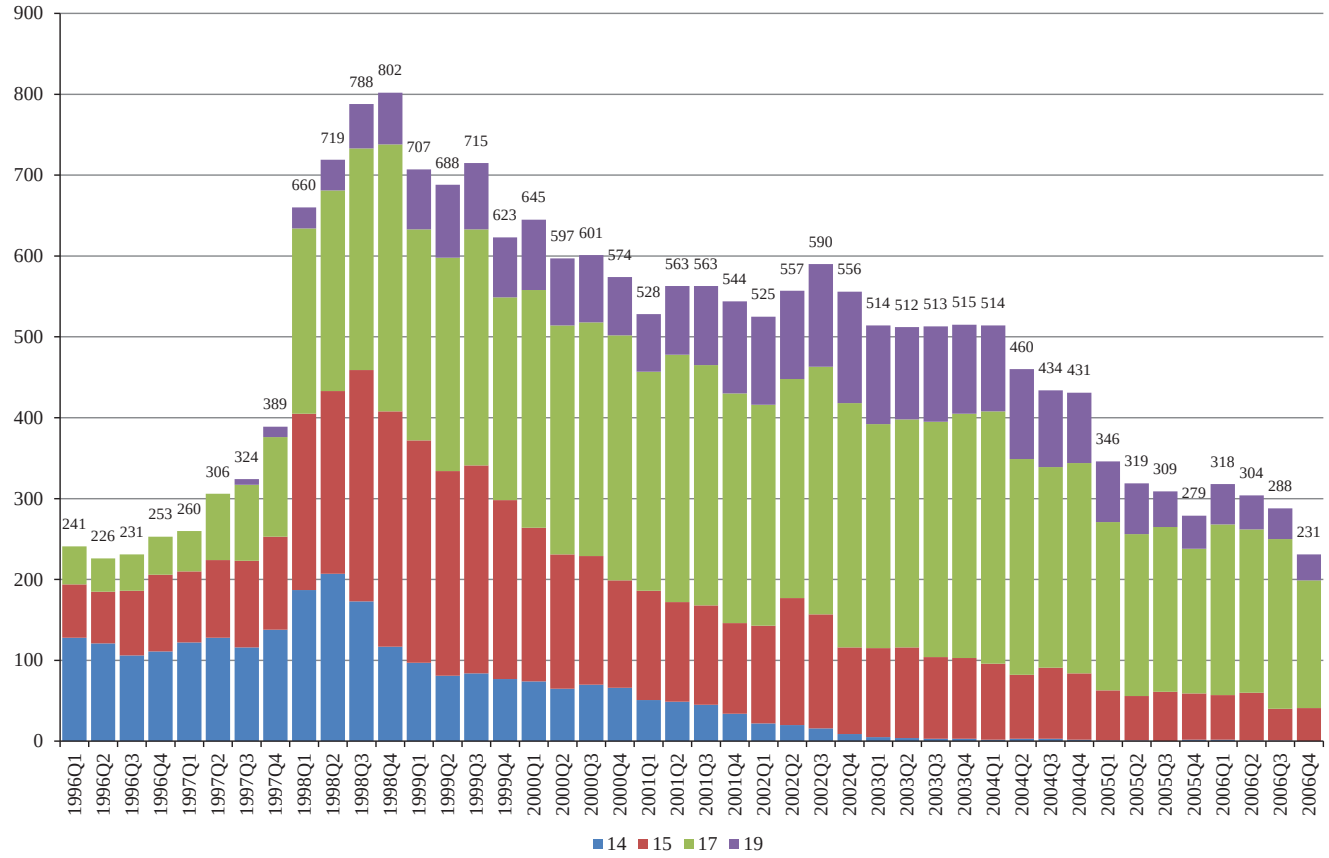
- "The first core question is whether the industry has a homogeneous product or not. Cartels are far more likely if the product is fairly homogeneous between companies in the market." Grout, Paul A., & Sonderegger, S. M. I. A. (2005). *Predicting Cartels (OFT 773)*, Office of Fair Trading, at 15.
- "Firms have more difficulty agreeing on relative prices when each firms product has different qualities or properties. Each time a product is modified, a new relative price must be established. It is easier for a cartel to spot cheating when all it has to do is examine a single price. It is relatively difficult to detect price cutting that is achieved by an increase in quality; a firm could increase its quality and hold its price constant if it wanted to increase sales without explicitly violating the pricing agreement." Carlton and Perloff, at 135.

[62] Rhoda Alexander, Brian Fedrow, and Joseph A. Castellano, Monitor Market Trends, 10th Edition, Stanford Resources, Inc., 1996, Appendix A. CDT manufacturers also differed in the level of service they provided. For example, one TAEC document stated "Provide JIT(warehouse)/BTO(TDDI) to improve Toshiba's CDT business responsiveness." TAEC-CRT-00065220, at 31. "For the last 5 years, Toshiba has maintained a technology leadership role in CDT development. In some instances, such as the 17" and 19" introduction, this leadership role and Toshiba's reputation has been impacted by Toshiba's inability to deliver a quality product, on-time at a competitive price." TAEC-CRT-00065220, at 34.

[63] The analysis of prices in Appendix C was performed on data that was aggregated to the level of CDT size, finish, manufacturer, model number and customer. The reported prices are for the ITC finish as this category accounted for the largest dollar volume.

Figure 10

Number of CDT Models by Size



Data Source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibit 64.
Source File(s): all_defendants_dropexout_collapsed.dta; input_data.do; p101_cdt_price_by_size.do; a101_cdt_price_by_size.xlsx

46. Dr. Netz also recognizes that CDT manufacturers often must design their products specifically for a given manufacturer's needs based on "design in competition."[64] I understand that once a monitor manufacturer has chosen a specific CRT for a particular model of monitor, it cannot easily substitute a different vendor's CRT into that particular monitor. Because of the heterogeneity across products and customers, CDT prices were individually negotiated with large customers. For example, the price data in Section III shows that CDT prices and price changes varied widely across customers and transactions.

47. As shown in greater detail in Section III, a detailed analysis of CDT transactions prices and products confirms the substantial heterogeneity of products and customers and evidences the reduced likelihood of effective coordination on price. In particular, the evidence shows that:

- CDT prices exhibit wide dispersion;

[64] "Due to the technical product differentiation that is necessary to the incorporation of tubes into monitors and TVs, competition among CRT vendors is for design-in, not each individual CRT order. That is, when a TV or monitor manufacturer develops a new model, the CRT vendors compete to win the design." … "Once a TV or monitor manufacturer has chosen a specific CRT as the basis for a given model of TV or monitor, it cannot readily substitute a different vendor's CRT into the finished product." Netz Expert Report, at 10-11.

- CDT price changes exhibit wide dispersion.
- CDT prices and price changes differed greatly from changes in alleged target prices.

48. The differentiation among CRT products, customers and prices would have made it difficult for cartel members readily to compare actual prices to the alleged cartel target prices, making it more difficult to detect which firms were not complying with the target prices of alleged cartel.[65] Similarly, such differentiation would have made enforcement of alleged cartel prices more difficult. Differentiated and customized products also complicate punishment efforts since they make it more difficult for the cartel to take sales away from a perceived "cheater," thereby making cheating on the cartel more likely to be profitable.

49. Substantial differences in technology and quality can lead to different price premia for different products even of generally comparable size as well as differing views across manufacturers on what price levels would be most profitable. Review of documents and information indicates that is the case here.

- "For CDTs of the same size and specifications, Japanese manufacturers commanded a $4 to $5 premium compared to Samsung, which, in turn, commanded a $2 to $3 premium over Chunghwa."[66]
- Mr. Song mentioned that differences between the manufacturers led to different discussions during the meetings, as he states that "LP or Chunghwa had a great gap in terms of the technology and other aspect[s] compared to us."[67]
- "As prices continue to decline on 15- and 17-inch units more of that production is expected to move off-shore as well. Japanese manufacturers remain solidly in control of the increasingly stringent high-resolution workstation market where design expertise, attention to detail, and quality control are vital. Although a few Taiwanese, Korean, and European vendors are active in this market, Japanese vendors such as end-user favorite Sony are expected to maintain the leadership position."[68]
- In July 1999, LG complained about not being able to compete at the same price level: "Honestly, LG is absolutely weaker than Samsung and Chunghwa, so LG cannot compete at the same price level."[69]

[65] According to Mr. Kim, the price discussions were at a very ambiguous, general level, since "the price of CDTs are determined through a very complicated process." For every given size of CDT product, there are a number of different specifications that have different prices. Mr. Kim mentions a few examples: surface treatment (glare vs. non-glare), anti-radiation (MPRII), different surfaces (round vs. flat) and length. All these specifications led to prices that could differ significantly. Mr. Kim also states that prices would differ by the type of orders a customer made, "for instance, prices offered to customers with long-term agreements with us, and prices that would be offered to customers who would buy high-priced products." Mr. Kim states that the terms of payments between customers varied as well: "there were customers who would request bank guarantees and there were customers who would request credits." Customers also differed in terms transportation, insurance and shipment payments, as "for some customers we [SDI] will be in charge of paying those fees, whereas other customers themselves would pay those fees." Similarly, "the prices offered to customers who would have the credit line of 60 days or 90 days were more expense – were higher." 27 March 2013, Deposition of Deok-Yun Kim, Volume 1, at 27:1-29:13.

[66] Netz Expert Report, Note 220, citing Deposition of Chih Chun-Liu, Vol. 1, 19 February 2013, at 70:24 - 72:9.

[67] 13 December 2012, Deposition of In Hwan Song, Volume 2, at 191:12 - 14.

[68] Rhoda Alexander, Brian Fedrow, and Joseph A. Castellano, Monitor Market Trends, 10th Edition, Stanford Resources, Inc., 1996, at 93.

[69] SDCRT-0086662 - SDCRT-0086664, at 6662E.

50. As discussed above, Dr. Netz recognizes that successful cartels must be able to frequently adapt to changes in market conditions over time (where such changes are occurring). This adaptation is more difficult when prices are declining at varying rates, price transparency is limited, when products are heterogeneous and changing rapidly, and when it is difficult to determine whether price changes or any observed prices are due to changes in market conditions or cheating by particular members of the cartel. Coordination is made even more complex when capacity, production, market shares and product mix are changing over time, and across manufacturers. As discussed above, uncertainty in demand or changes in demand enhance incentives to "cheat" on any coordinated arrangement.

D. Dr. Netz's use of documentary evidence to establish conspiracy effectiveness

51. Dr. Netz argues that collusive overcharges must have been substantial because the CDT manufacturers accepted the costs and risks of such collusive activities for many years, and would not have done so absent a substantial economic gain.[70] However, the fact that meetings and communications may have taken place for many years does not prove that the conspiracy was highly effective; nor does it prove the existence of substantial overcharges. One widely cited study of cartel practices states: "Cartel duration is the most common measure of cartel success because it is the most easily measured, but it is clearly unsatisfactory in capturing the economic impact of cartels. There are cases where cartels have continued to exist on paper for many years with little sustained effect on price."[71]

52. In addition, as discussed further in Section III below, the documentary record in this case also provides substantial evidence of competitive rivalry and non-cooperative behavior among CDT manufacturers. Individual defendants frequently accuse one another of undercutting target prices, stealing market share or otherwise "cheating" on alleged cartel agreements.[72] In fact, as described below, firms such as SDI, LG, LPD and Chunghwa experienced substantial gains in market share despite alleged agreements on price, output and capacity.

53. Importantly, much of the documentary evidence cited by Dr. Netz is inherently ambiguous regarding effect and is not a substitute for a detailed empirical analysis. Dr. Netz appears to agree with this when she states: "…narrow anecdotal documentary evidence cannot substitute for the quantitative analysis I have presented of the extent to which actual prices matched cartel target prices, using all suitable price data available."[73] As shown in detail in Section III below, the evidence on the extent to which actual prices matched target prices is consistent with widespread *non-adherence* to target prices. Such non-adherence is consistent with both ineffectiveness of any alleged conspiracy and/or widespread "cheating" on target prices. More importantly, as shown in Section IV, a detailed econometric analysis of CDT prices is consistent with a finding of at most modest overcharges.

54. In analyzing the economic effects of the alleged conspiracy, it is important to recognize that individual firms have legitimate independent business reasons to obtain "competitive intelligence" about the markets in which they operate in and about their competitors. Information about such factors as competitors' product offerings, as well as their production capability, quality, service levels, customer relationships, etc. are important market-based information that can be used by individual firms to compete more effectively. Such information

[70] Netz Expert Report, at 31.
[71] Levenstein, Margaret C. and Suslow, Valerie Y., "What Determines Cartel Success?" Journal of Economic Literature, Vol. 44(1), 2006, at 45. Moreover, as a matter of economics, given the large magnitude of CDT sales, it could make financial sense to participate in a cartel even if the overcharge was small as a percentage of sales.
[72] See Section III Below.
[73] Netz Class Cert Rebuttal Report, at 30.

may reduce uncertainty and make firms more willing to undertake pro-competitive business transactions or risky investments. This type of information can be valuable to individual firms for reasons that have nothing to do with collusion.[74] For this reason economists typically evaluate the potential procompetitive benefits of such activity along with any potential anticompetitive effects.[75]

III. BASIC EMPIRICAL EVIDENCE ON THE CDT INDUSTRY IS CONSISTENT WITH LIMITED CONSPIRACY EFFECTIVENESS AND AT MOST MODEST OVERCHARGES.

A. Evidence on trends in CDT prices

55. CDT prices generally were declining throughout most of the relevant time period. When we consider the alleged cartel period as a whole, CDT prices declined substantially faster during the alleged 1995Q2- 2007Q4 cartel period (-3.2% per quarter) than they did in either the 1993Q1-1995Q1 pre-cartel period (-1.1% per quarter) or the post-cartel period. In fact, during the 2008Q1-2008Q4 post cartel period, CDT prices actually increased (1.2% per quarter).[76] This is shown in Figures 11-12. The fact that prices fell substantially more rapidly during the alleged cartel period than they did during periods when no cartel activity is alleged provides relatively simple, yet powerful, evidence against Dr. Netz's claims of a highly effective conspiracy that produced large overcharges.

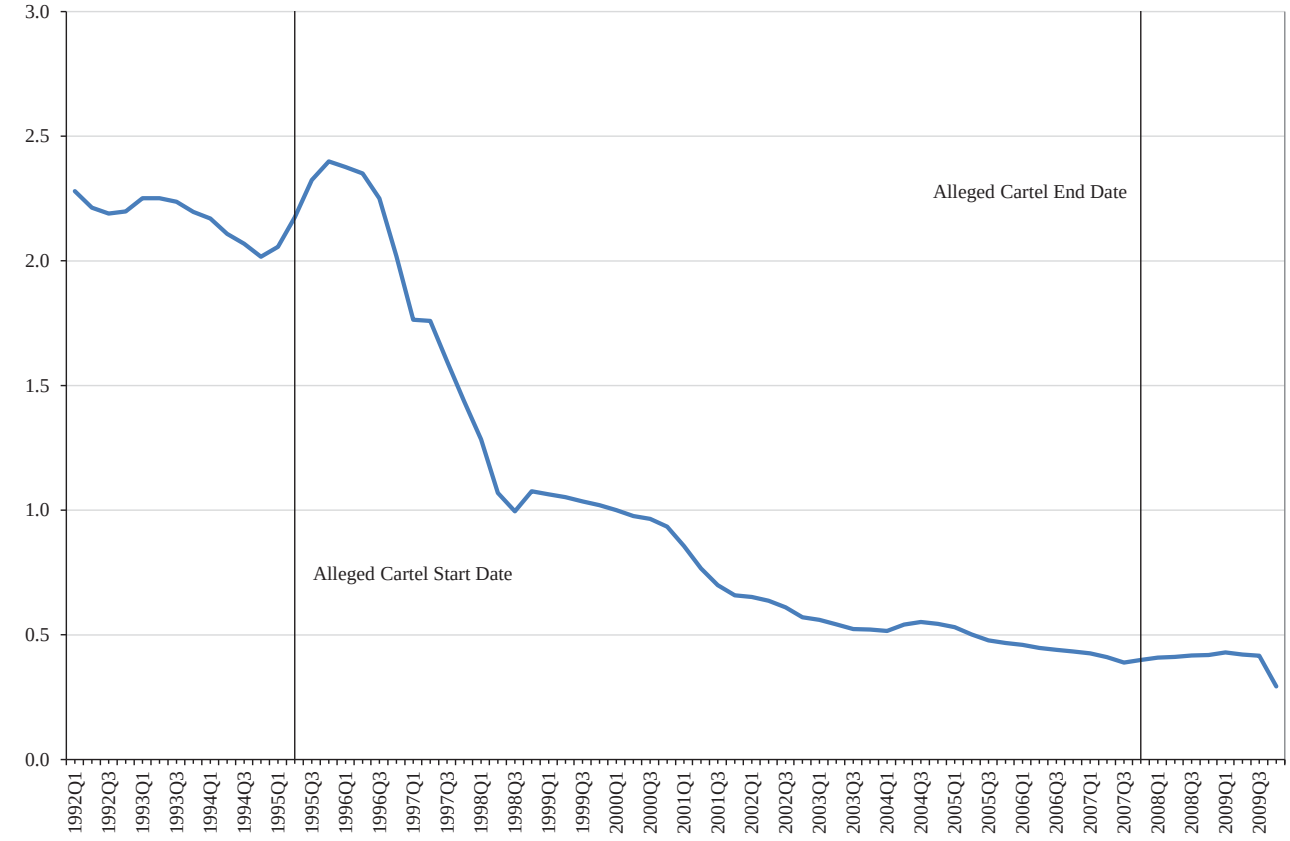
[74] Dr. Netz recognized these principles in her deposition. "Q. Dr. Netz, you'd agree with me that there are procompetitive rationales for information sharing …THE WITNESS: Yes. […] Q. It is not your opinion that there are no procompetitive reasons firms might -- firms would seek out information about prices, capacity, and production amounts of its competitors? A. Yes. Q. BY MR. FOSTER: "Yes," it's not your opinion? A. Correct. . . . Q. In the absence of such information that I mentioned in my last question, you would expect that firms might be more risk averse and less likely to make investments in that industry; correct? A. That's possible, yes. Q. Okay. That would be an expectation, all things being equal? A. All things being equal, yes." 27 June 2014, Deposition of Janet S. Netz (Hereinafter "Netz Deposition"), at 193:4-194:6.

[75] See, e.g. Andrew M. Rosenfield, Dennis W. Carlton & Robert H. Gertner, "Communication among Competitors: Game Theory and Antitrust," Application of Game Theory to Antitrust," 5 George Mason Law Review 423 (1997).

[76] Dr. Netz analyzes two alternative ending dates for the alleged CDT conspiracy 2006Q4 and 2007Q4. If we include 2007 in the post-conspiracy period, the average price decline during the alternative alleged post-conspiracy period of 2007Q1 – 2008Q4 is -0.4 percent per quarter.

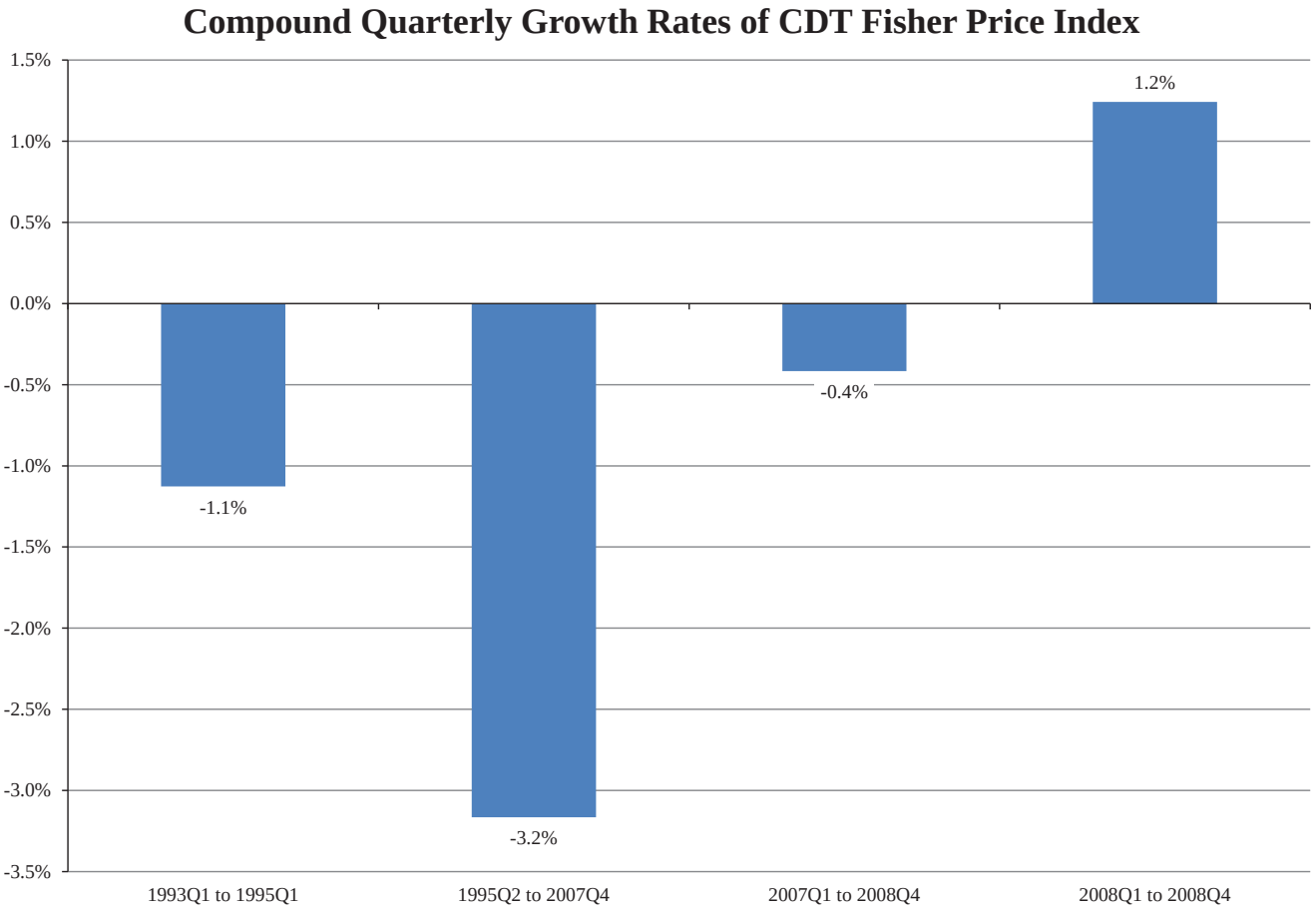
Figure 11

CDT Fisher Price Index



Note(s): Base period for Fisher price index is 2000Q1.
Data Source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibit 64.
Source File(s): all_defendants_dropexout_collapsed.dta; tukey filter.do; fisher app-quarter.do; fisher_app_q.xlsx; a001_fisher_app_quarter.xlsx

Figure 12



Data Source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibit 64.
Source File(s): all_defendants_dropexout_collapsed.dta; tukey filter.do; fisher app-quarter.do; fisher_app_q.xlsx; a001_fisher_app_quarter.xlsx

56. While CDT prices generally declined substantially during the alleged cartel period, Figure 12 indicates that CDT prices did increase somewhat in 1995. However, it is highly unlikely that the price increases in 1995 are due to the alleged conspiracy for (at least) two reasons: 1) There is substantial evidence that the level of allegedly collusive activity was low in the early years of the alleged conspiracy, and 2) there are more plausible alternative explanations for these 1995 price increases that are unrelated to the alleged conspiracy. As I discuss in Section IV below, it is likely that these price increases driven by non-cartel factors are what drive Dr. Netz's calculations of large overcharges in 1995 and 1996.

57. With respect to the first point, Dr. Netz's own target price database shows no target prices for any size of CDT during all of 1995 and the first quarter of 1996. Dr. Netz reports two CDT target prices in the second quarter of 1996, and then nothing until the fourth quarter. Accordingly, Dr. Netz has identified no target prices in 1995 and very little target price coverage until the fourth quarter of 1996, by which time CDT prices were already declining. This lack of target prices is particularly noteworthy in light of the emphasis placed by Dr. Netz on the use of target prices as a key mechanism of the alleged cartel.

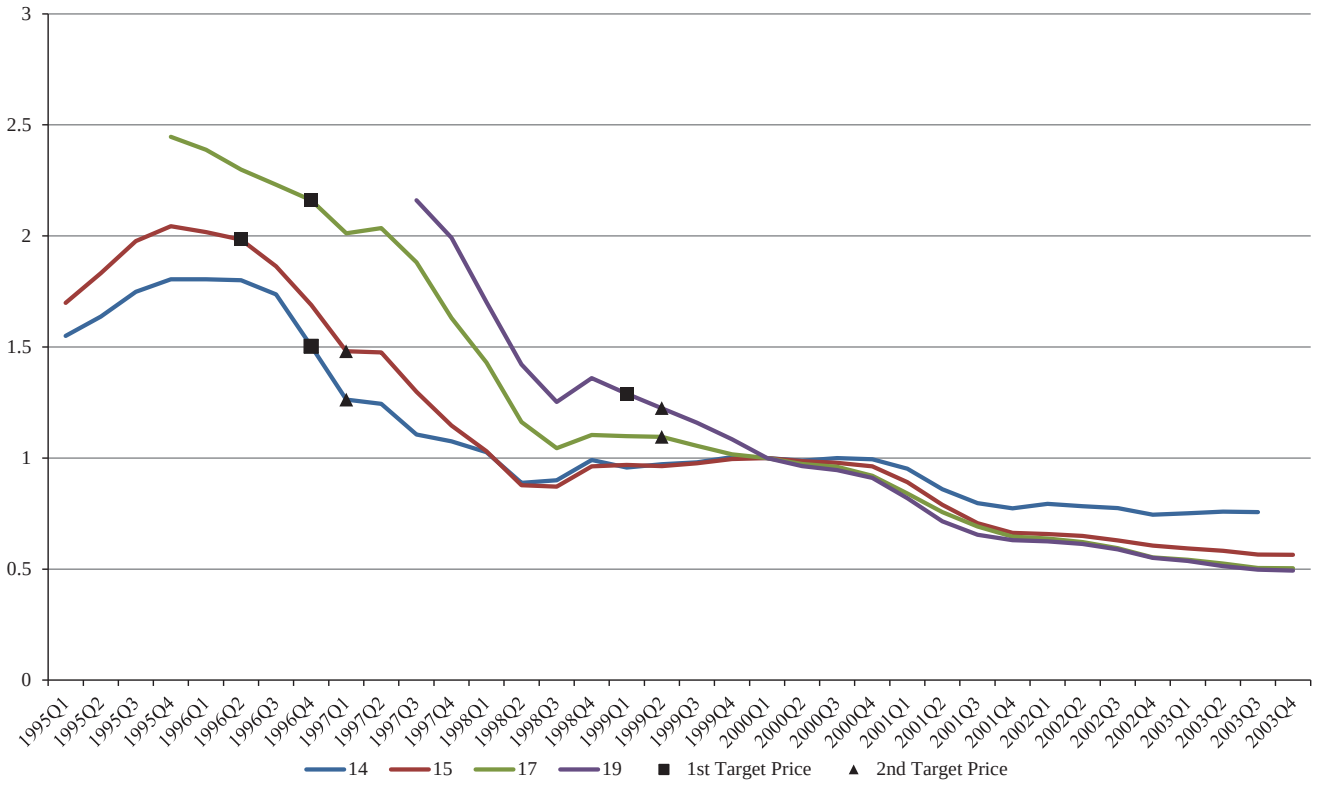
58. To illustrate the lack of target prices during the 1995 price increases in greater detail, Figure 13 shows Fisher price indexes of Dr. Netz's CDT price data along with the timing of the earliest target price observations in

Dr. Netz's dataset. For each size of CDT, the first and second quarters that Dr. Netz reports a target price are indicated with symbols on the Fisher price lines. These data show that:

- Dr. Netz's database shows no target prices for 14 inch CDTs until fourth quarter of 1996, long after the price increases in 1995. In fact, by the time of the first target price, CDT prices have already declined significantly.
- For 15 inch CDTs there are no target prices in 1995, and target prices first appear in the second quarter of 1996, again well after the 1995 price increases.
- For 17 inch CDTs there are no target prices until the fourth quarter of 1996. Then there are no additional target prices until the second quarter of 1999, by which time 17 inch CDT prices have already fallen dramatically.
- For 19 inch CDTs there are no target prices until 1999.[77]

Figure 13

CDT Price Indices by Size with Earliest Target Price Observations From Dr. Netz's Database



Note(s): Base period for all indices is 2000Q1. For each size, chart indicates timing of the first and second target price identified by Dr. Netz.
Data Source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibit 64.
Cartel meeting notes; see Target price-structure.xlsx.
Source File(s): combine_target_defendant.dta; fisher_app_size_q.xlsx; p053_netz_fishers_by_size.do; a053_netz_fishers_by_size.xlsx

[77] See my backup files "p020_first_netz_target_by_size.do" and "a020_first_netz_target_by_size.xlsx."

59. Similarly, there is no evidence that the price increases in 1995 are due to collusive output restrictions. Dr. Netz's Exhibit 28 lists documents that she characterizes as instances in which Defendants agreed to reduce production capacity or output. However, the earliest CDT-related instance (and the only instance in 1995 or 1996) on this list is from a meeting that occurred in late November 1996, far too late to have any role in explaining the price increases in 1995. Moreover, Dr. Netz provides no evidence of output or capacity coordination during this period, and the empirical evidence presented above shows that several manufacturers were significantly increasing capacity and output during this period – and indeed introducing new sizes and models.

60. While Dr. Netz cites two other documents in her report relating to alleged communications among the defendants from 1995,[78] as discussed herein, the defendants were adding capacity and increasing output throughout 1995, and indeed until around 2000 when demand began to decline. The rapid growth in capacity and output that was being planned and put in place in 1995 and later years produced substantial excess capacity causing prices to decline rapidly during later years such as 1996-1998.[79] In short, the empirical evidence does not support the proposition that the defendants were successfully coordinating in 1995 or that the price increases that occurred in 1995 were caused by the alleged conspiracy.[80]

61. While there is very little evidence that the 1995 price increases could be due to the alleged conspiracy, there is substantial evidence that these price increases were due to non-cartel factors such as rapid demand growth, capacity shortages and glass shortages. Demand for CDTs grew very rapidly in 1995 due to rapid growth in desktop computers. For example, an internal Hitachi document shows annual data on the estimated growth of CDT demand for different sizes of CDTs. The overall demand for CDTs was estimated to have grown by 31.1 percent in 1995. In addition, the document shows that demand growth was particularly high for larger CDTs such as 15 and 17 inch CDTs. 15 inch CDTs had an estimated annual growth rate in 1995 of 93.3 percent and 17 inch CDTs had an estimated growth rate of more than 200 percent.[81]

[78] Netz Expert Report, at 42, citing
- 14 February 1995, SDCRT-0086208 - SDCRT-0086210.
- 29 May 1995, CHU00028933 - CHU00028945, at 8933.01E.

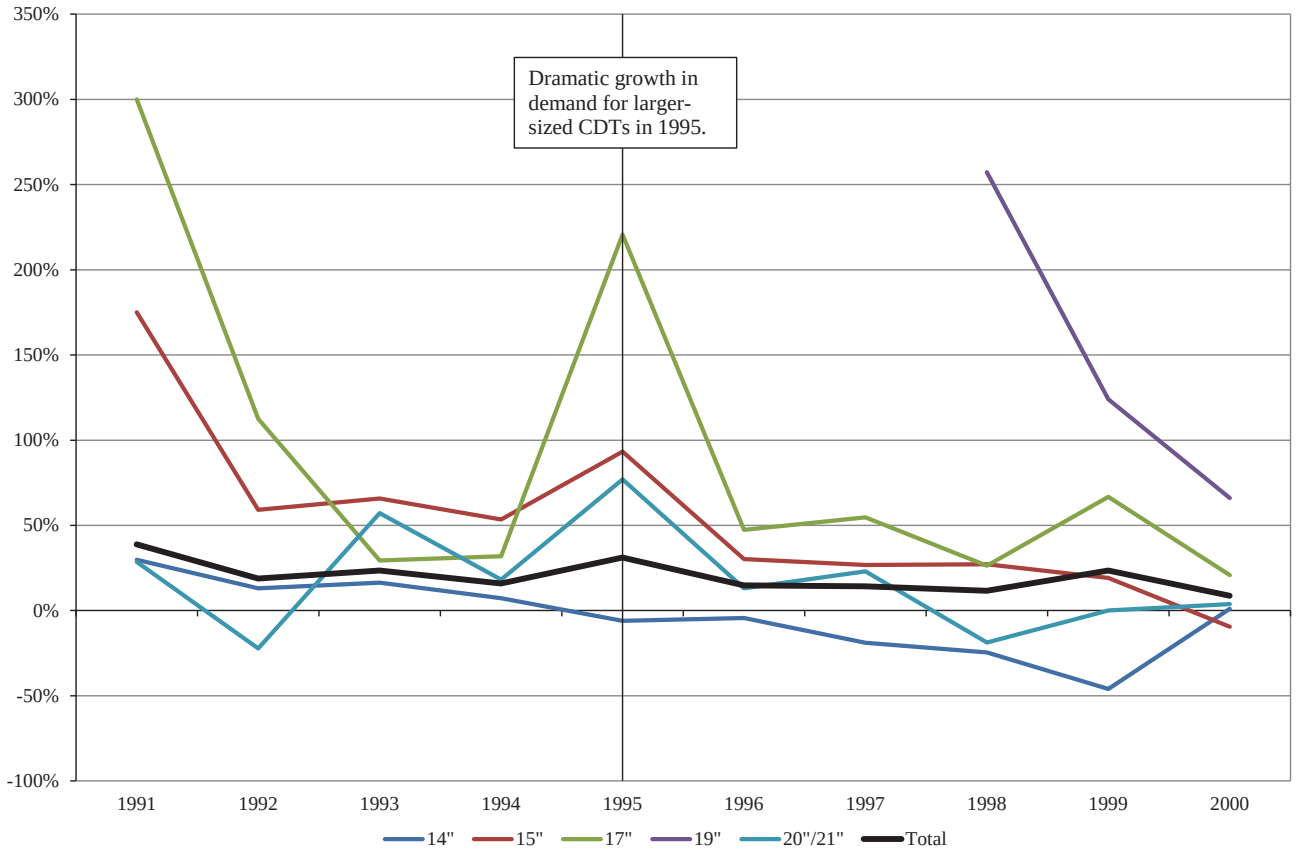
[79] See, e.g.,
- "As per last year's expected capacity increases, the supply demand situation is further out of balance. This has resulted in significant price erosions in CMT in 1997 (minus 30% versus average of 1996). Further price erosion at about -10% is expected in 1998 and 1999 and will soften only after that year when supply/demand is in balance again." LPD-NL00018267 – LPD-NL00018336, at 8270.
- "CMT prices on average have eroded drastically during 1997 (-30%). This was more severe than expected due to massive overcapacity. We expect the average market price erosion over the total review period to be at 3-4% for the 14" and 15", 5% for 17" and up to 6% annually for the 19." LPD-NL00018267 – LPD-NL00018336, at 8276.

[80] In addition, low concentration and more diversity of strategies with the larger number of firms in the industry would have made coordination difficult.

[81] HDP-CRT00048109.

Figure 14

Annual Growth Rates of Worldwide CDT Demand by Size



Data Source(s): HDP-CRT00048109.
Source File(s): HDP-CRT00048109.XLS; a008_cdt_demand_by_size.xlsx

62. In part this high demand for larger size and higher resolution monitors and CDTs was due to the widely expanding functionality and performance of desktop computer hardware and software. For example, several trade press articles from this time period emphasized the growing role of applications such as desktop publishing, video games with advanced graphics and the introduction of Microsoft Windows 95 software. Some examples are given below:

- "Distributors said 15-inch monitors already are in short supply, yet the demand continues to skyrocket. The 15-inch and 17-inch models are replacing 14-inch screens as the standard, and their popularity is expected to grow with the planned August release of Microsoft Corp.'s Windows 95."[82]

- "Color monitors with screens 15 inches and larger--once the domain of artists, graphics designers and high-end publishers--have greatly broadened their base, having become affordable and desirable in personal computers. …The advent of Windows software and resultant proliferation of graphical user interfaces in the PC world, the availability of economical color printers, and dramatic price decreases

[82] Pereira, Pedro, "Higher monitor prices looming -- Shortages of cathode ray tubes, higher production costs in Japan taking a toll," *Computer Reseller News*, 10 April 1995. http://global.factiva.com (accessed 27 July 2014).

in large-screen color monitors have all worked to intensify color-monitor demand. Windows has also dramatically increased the demand for monitors larger than 14 inches." [83]

- "Sales of color display tubes for computer monitors were up sharply in Japan and overseas. This was attributable to much higher worldwide PC sales, in concert with rising demand for high resolution and large-screen monitors. Orders for 15 inch and 17 inch models increase significantly, while demand for 14 inch units declined. Toshiba responded quickly to this trend, starting full-scale production of 15 inch and 17 inch Microfilter display tubes…. To bolster production capacity Toshiba began making TV color picture tubes at an Indonesian joint venture in June 1996."[84]

- "For manufacturers and OEMs alike, 1995 was something of a feeding frenzy. Faced with skyrocketing consumer demand, OEMs scoured the Far East in search of monitors to package with their CPUs. Manufacturers, caught between escalating tube costs, glass shortages and increased demand were forced to juggle product between customers. Like the fish that got away, everyone involved was left with a feeling of ""if only."" No one will ever really know just how big the year could have been if supply had been adequate. But like all good fish tales, we imagine it would have been really, really big."[85]

- "Figure 2 – 4 illustrates the worldwide unit monitor market forecast by diagonal screen size and CRT type. The greatest market share increase will occur in the 15 to 18 inch diagonal category, growing from 45.3% in 1996 to 79.9% in 2002. This trend reflects the change in manufacture/end-user attitudes regarding production and consumption of smaller CRT – based monitors as well as anticipated changes in equipment design. Specific emerging application categories, such as desktop publishing, online services, and Windows, have caused an upward shift in monitor sizes from 14 to 15 or 17 inches for some monitor subcategories, especially in desktop personal computers."[86]

63. In light of the rapid growth in the demand for monitors and CDTs, the CDT manufacturers responded by increasing their capacity and output. For example, Dr. Netz's own data indicates that total CDT production increased by 14 percent in 1994 and 38 percent in 1995.[87] However, despite this rapid growth, the evidence indicates that the manufacturers were not able to expand capacity rapidly enough to fully meet the booming demand in 1995. Contemporaneous documents indicate that CDT capacity was very tight during this period. In addition, some other supply related problems, such as shortages of glass for making CRTs exacerbated the shortages of CDT supply during 1995. In addition to the documents cited above, some additional examples of contemporaneous documents discussing these and other supply issues are provided below[88]

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[83] Derman, Glenda, "Large color monitors thrive in today's PC world," *Electronic Engineering Times*, 05 June 1995. http://global.factiva.com (accessed 27 July 2014).
[84] Toshiba Corp.'s 1996 annual report, at 19.
[85] Alexander Rhoda, Brian Fedrow, Joseph A. Castellano, Monitor Market Trends, Tenth Edition, 1996, Stanford Resources, Inc., 1996, at 79.
[86] Alexander Rhoda, Brian Fedrow, Joseph A. Castellano, Monitor Market Trends, Tenth Edition, 1996, Stanford Resources, Inc., 1996, at 13-14.
[87] CDT production data used in Dr. Netz's Exhibit 9. These calculations are detailed in my backup file "a054_total production.xlsx". See also documents cited in footnote 128 documenting rapid capacity expansion during this period.
[88] Dr. Netz recognized in her deposition that to the extent that there were CDT capacity shortages and glass shortages, such factors could have caused the increase in prices during 1995: "So I'd like to ask you a hypothetical: If there was a capacity shortage of CDT prices -- of CDTs in 1995 could that have been responsible for a rise in prices during that year as opposed to

- An internal business plan dated March 9, 2001 related to LG Philips Displays contains data on CDT demand and capacity covering the time period 1994 through 2000 along with a projection through 2005. [89] The document shows substantial excess capacity in most years except 1994 and 1995. In particular, CDT demand is shown to be very close to CDT capacity in 1995.[90] This document and many others also confirm that CDT manufacturers invested heavily during the 1990s to bring on new CDT capacity.

- An internal analysis of desktop demand, monitor production and CDT production prepared by Toshiba Corp. in April 1998 shows that desktop demand and monitor production was essentially equal to CDT capacity in 1995.[91]

- A May 1995 presentation by LG Electronics titled "Color CRT market data" showed that monitor demand was expected to be very close to CDT supply in 1995. The document also illustrates the rapid projected increase in color monitor demand and CDT production during 1993 through 1998, as well as the rapid transition from 14" CDTs to larger sizes.[92] This document and many others show that CDT manufacturers were investing heavily during this period to bring on new CDT capacity in light of rapid demand growth.

- A 1996 industry report stated: "Over the past few years, the CRT industry has gone through some radical price increases for such a mature industry. These price increases were due to the component parts which comprise the finished CRT. A shortage in glass was the major culprit. In early 1994, an unusual number of glass manufacturers underwent tank repairs which limited the amount of glass which could be produced. At that time, tank repair could typically take up to 8 weeks. The beginning of the demand shift for computer data display tubes to 15-inch and 17 -inch sizes from 14-inch also demanded more glass. The increasing screen sizes in television tubes had also put more demands on the glass manufacturers which caused price increases. In addition, the Kobe earthquake in late 1994 led to short-term shortages for yokes as facilities were damaged and transportation abilities were hindered."[93]

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a cartel effect if that had taken place? A. Relative to an earlier period where there weren't capacity constraints. Q. Yes. A. Production and capacity -- yes that could play a role. Q. How about a glass shortage? If there was a glass shortage during a particular year that you studied during the cartel period in comparison to other periods a greater shortage could that have been responsible for an increase in price different from the cartel effect? A. If there were an actual glass shortage it might cause that to happen, yes." Netz Deposition, at 132:25 – 133:16.

[89] 09 March, 2001, PHLP-CRT-090615, at 12.

[90] When asked in her deposition if she found any evidence of CDT capacity shortages in 1995, Dr. Netz concluded that there was no evidence of shortage even though her own data indicated that production was equal to capacity in 1995. Netz Deposition, at 79:9-19. In contrast to Dr. Netz's answer, a situation where reported production is equal to capacity is fully consistent with capacity constraints.

[91] 22 April 1998, TSB-CRT-00036829.

[92] 29 May 1995, CHU00028933 - CHU00028945, at 8940E.

[93] George R. Aboud, Joseph A. Castellano, Brian Fedrow, Cathode Ray Tubes, First Edition, 1996, (Stanford Resources, Inc., 1996), at 72. See, also,

- Pereira, Pedro, "Higher monitor prices looming -- Shortages of cathode ray tubes, higher production costs in Japan taking a toll," *Computer Reseller News*, 10 April 1995. http://global.factiva.com (accessed 27 July 2014):
  - Channel players are bracing for monitor price increases as manufacturers try to cope with cathode ray tube shortages and the higher cost of production in Japan.

64. These non-collusive explanations for the 1995 price increases also are supported by the fact that CDT prices of all types plummeted from 1996-1998 as these supply issues were resolved (Figure 13), despite alleged attempts by the defendants to arrest the decline in prices.[94] Contemporaneous documents discuss these factors as well.[95]

B. Dr. Netz's claims relating to alleged price-fixing and target prices

65. Despite the evidence that CDT prices declined more rapidly during the alleged conspiracy period than either before or after, Dr. Netz alleges that the defendant manufacturers engaged in effective coordination of CDT pricing through extensive use of target prices. However, in contrast to Dr. Netz's claims that such activity was highly effective and produced substantial overcharges, empirical analyses of CDT prices show substantial evidence that the defendant manufacturers did not adhere closely to alleged cartel target prices. In fact, actual

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- Distributors said prices at their level have started to climb by less than $10 on low-end monitors to as much as $100 on the higher-resolution units. This translates into an across-the-board average of between 5 percent and 10 percent, said industry insiders.
- Glass production has fallen short of the high demand created by the migration from 14-inch screens to larger and higher-resolution models, said distributors, monitor vendors and analysts.
- Distributors said 15-inch monitors already are in short supply, yet the demand continues to skyrocket. The 15-inch and 17-inch models are replacing 14-inch screens as the standard, and their popularity is expected to grow with the planned August release of Microsoft Corp.'s Windows 95.
- Rhoda Alexander, a senior analyst with research firm Stanford Resources Inc., San Jose, Calif., said increased glass production would solve the shortage problem, but she expects the shortage to last through year's end. "The world's glass capacity hasn't increased to meet all the demand. There wasn't enough production," said Alexander.

Additional documentation of these supply and demand conditions in 1995 is provided in Appendix D.

[94] Dr. Netz cites numerous alleged target prices as well as alleged output restrictions during this period when CDT prices are dropping extremely rapidly. This illustrates the ineffectiveness of this alleged conduct during this period. See my backup file "CDT Target Price Coverage by Quarter.xlsx" and Netz Expert Report, Exhibit 28.

[95] Bliss, Jeff, "Pricing: Monitors stabilize, DRAM dips -- Prices stabilize the board; 15-inch monitors in supply," *Computer Reseller News* 18 March 1996. http://global.factiva.com (accessed 27 July 2014):

- Monitor prices are stabilizing-and in some cases, dropping-as the shortage in cathode ray tubes begins to ease.
- Glass-supply problems-caused primarily by the growing popularity of 15- and 17-inch models over 14-inch units and for big-screen TVs, which compete for the CRTs-have lessened with the retooling and building of CRT plants and recent smaller-than-expected sales of PCs in the retail sector, said vendors and analysts.
- The crisis appears almost over for 17-, 20- and 21-inch supplies, while stocks of 15-inch monitors-which were the most affected by the shortage-have been shored up considerably, said Rhoda Alexander, senior market analyst for CRT monitors at Stanford Resources Inc., San Jose, Calif.
- "We actually have been seeing [supply problems] ease quite a bit," said Mark Gersh, product manager at ViewSonic, Walnut, Calif.
- Retail PC sales in the first quarter that did not meet expectations also lowered monitor sales, allowing supply to catch up, manufacturers said.
- "[Supply] obviously is improving as sales slow down," said John Grundy, senior national marketing manager of monitors for Samsung Electronics, in Ridgefield Park, N.J.
- CRT manufacturers simultaneously have been so successful in refitting plants and in building new factories to meet the demand in 1995, monitor vendors said, that tube prices have been reduced-a discount that allowed monitor prices to be dropped.

"As per last year's expected capacity increases, the supply demand situation is further out of balance. This has resulted in significant price erosions in CMT in 1997 (minus 30% versus average of 1996). Further price erosion at about 10% is expected in 1998 and 1999 and will soften only after that year when supply/demand is in balance again." LPD-NL00018267 – LPD-NL00018336, at 8270. "CMT prices on average have eroded drastically during 1997 (-30%). This was more severe than expected due to massive overcapacity. We expect the average market price erosion over the total review period to be at 3-4% for the 14" and 15", 5% for 17" and up to 6% annually for the 19." LPD-NL00018267 – LPD-NL00018336, at 8276.

CDT prices were frequently below the alleged target prices. In addition, actual prices and price changes exhibit wide dispersion across manufacturers and time as well as at any given point in time.

66. Before comparing actual CDT prices to target CDT prices, it is important to recognize that a large fraction of CDT sales was not covered by target prices even based on Dr. Netz's own analysis for matching actual CDT sales to target prices. Dr. Netz asserts that 39% of CDT sales during the class period were associated with a target price.[96] Thus, even based on her own methodology and calculations, Dr. Netz recognizes that she has not identified target prices for a majority of global CDT sales during the alleged conspiracy.[97] Moreover, Dr. Netz employs inappropriately broad product categories when she attempts to "match" CDT target prices to actual CDT sales, leading her to assume that she has an actual "match" between target and actual prices when she is ignoring many characteristics of CDT products and sales transactions that mean the match may be an incorrect one. For example, Dr. Netz matches based on a relatively general set of product characteristics including application, size, and finish (ITC or bare) while recognizing that many other characteristics such as such as aspect ratio, the type of shadow mask the CRT has, dot pitch, frequency, and coating potentially are relevant to CDT pricing.[98] While Dr. Netz might argue that such problems are due to lack of detail in the available data, this ignores the fact that she is assuming that the defendants would have been able to determine and adhere to target prices despite having far less data than Dr. Netz.

67. Moreover, Dr. Netz also overstates the extent of target price "coverage" by assuming that target prices discussed in a meeting applied to all Defendants in many cases regardless of whether a particular defendant actually attended the meeting or had any communications whatsoever regarding the alleged target price with other defendants.[99] Finally, in many cases Dr. Netz assumes that a given target price is in effect for a longer time period than was actually the case because she effectively assumes that a target price that was effective for any portion of a particular quarter was effective for the entire quarter.[100] For example, if a target price was set to be effective during the month of March, Dr. Netz assumes that it was effective for January-March.

68. While it is not possible to identify all of these "mismatches" between actual and target prices in Dr. Netz's database because of a lack of available data on CDT characteristics and other factors, I made use of alternative reasonable assumptions and re-estimated matches. The adjusted matching methodology differs from Dr. Netz's methodology and attempts a closer match by matching actual and target prices only if they share the same month

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[96] Netz Expert Report, at 63.

[97] I also note that Dr. Netz's target price coverage is particularly low in the 1995-1996 period. I show in Section IV below that these years are driving Dr. Netz's estimated overcharges. Even combining all sizes of CDTs together, there are no target prices in Dr. Netz's database until the second quarter of 1996, and the coverage for 1996 is far lower than in later years. The target price coverage calculations are provided in my backup file "CDT Target Price Coverage by Quarter.xlsx."

[98] "It is important to note that while all CRT models within a group are identical with respect to application, size, and finish, they are different with respect to other characteristics relevant to pricing, such as aspect ratio, the type of shadow mask a CRT has, dot pitch, frequency, and coating." Netz, Janet S., Ph.D., 01 October 2012, Declaration of Janet S. Netz, Ph.D., In Support of Motion of Indirect-Purchaser Plaintiffs for Class Certification, In re: Cathode Ray Tube (CRT) Antitrust Litigation (Hereinafter "Netz Class Cert Report"), at 63.

[99] Netz Deposition, at 160:25 – 161:5: "Q. And if it was not indicated one way or the other, you'd apply it to all alleged cartel members? If the target price was not specific to a specific manufacturer, you would apply it to all alleged cartel members whether or not they attended the meeting? A. Yes, that is correct." As discussed above, Dr. Netz identified at least the following categories of CDTs: finish, size, shape, resolution, frequency, safety standards, mask type, and neck diameter. However, her program for matching actual sales to target prices for calculating "coverage" only takes account of manufacturer, size, finish, and quarter. Netz Expert Report, note 203. Netz Expert Report, backup file "combine_target_defendant.smcl."

[100] Netz Expert Report, note 203.

(as opposed to quarter) and shape (where it is possible to identify the shape of the CDT sold), and only if the seller attended the meeting at which Dr. Netz alleges the target price was set. This approach addresses, to the extent possible with the available data, the problems with Dr. Netz's methodology discussed above. Using this approach, I have estimated a substantially lower estimate of roughly 16.4 percent of CDTs during the class period that can be associated with an alleged target price in Dr. Netz's data set. The fact that we (and Dr. Netz) are unable to match such a large portion of actual sales to target prices even with the benefit of extremely detailed sales databases and transactions level data many years after the fact further demonstrates the difficulties that would have faced alleged cartel members who would have had to conform their pricing for many products to such target prices as well as attempt to monitor and police adherence to target pricing in real-time with far less information available.

Table 2[101]

Share of CDT Sales with a Corresponding Alleged Target Price ("Target Price Coverage")

Coverage Using Dr. Netz's Matching Methodology	Maximum Coverage Using Corrected Matching Methodology
39.0%	16.4%

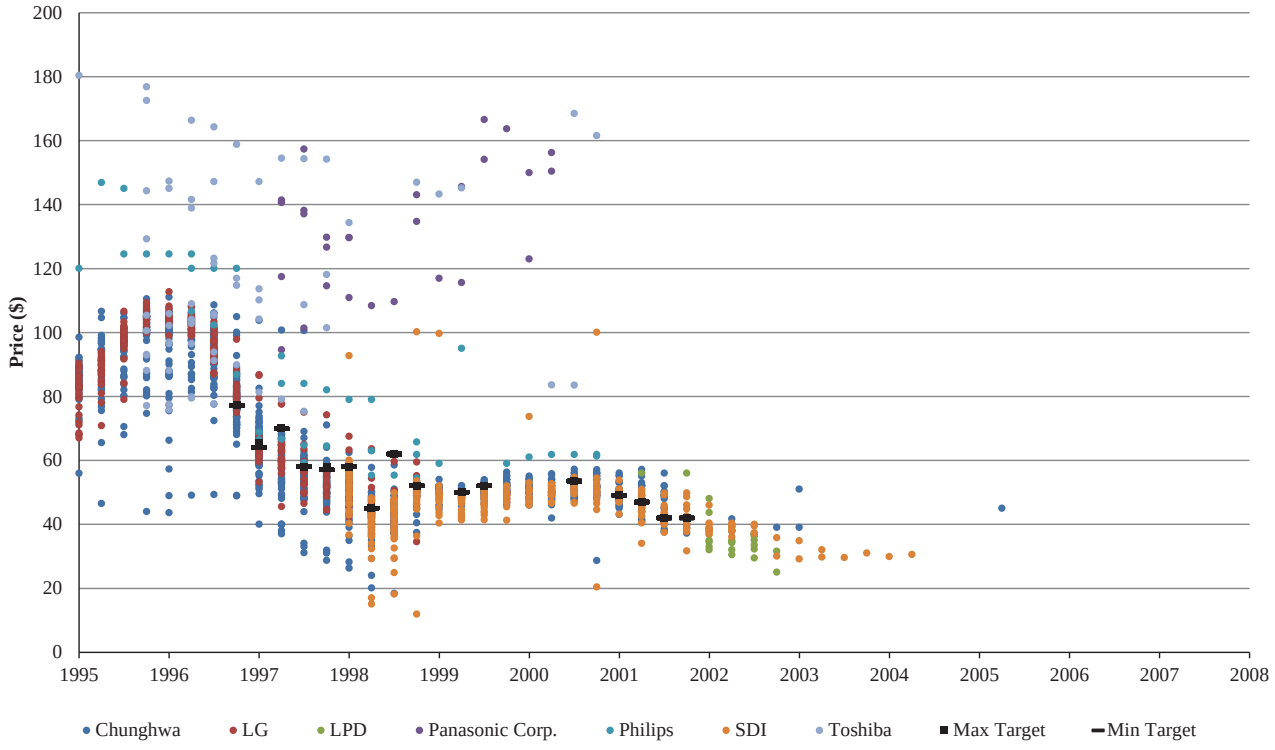
69. The preceding analyses showed that even by Dr. Netz's calculation there is a low proportion of sales that have associated target prices – where such target prices existed. Additional analyses of target and actual prices shows there is considerable variation in actual prices, and in target prices relative to actual prices over the period. The following graphics present examples of alleged target prices for each major size category of CDT (ITC) products and actual prices by manufacturer. Each of the figures shows substantial variation in actual prices across manufacturers and across individual products at each point in time particularly during the initial years. The variation in actual prices is much greater than that of the target prices for every quarter with a target price.[102] As described above, the figures also show that the first target prices identified by Dr. Netz occur significantly after the CDT price increases that occurred in 1995. For some product categories, there are substantial periods with no target prices. For example, for 17 inch CDTs the figure shows that Dr. Netz identifies only one target price event in late 1996 and then none until 1999.

[101] See my backup file "Share of CDT Sales with a Corresponding Alleged Target Price.xlsx."

[102] In contrast to the wide variation in actual prices visible in each chart, the difference between the minimum and maximum target prices in any given quarter often is visually indistinguishable in these charts. This also illustrates how little of the variation in actual prices in a given quarter is explained by target prices.

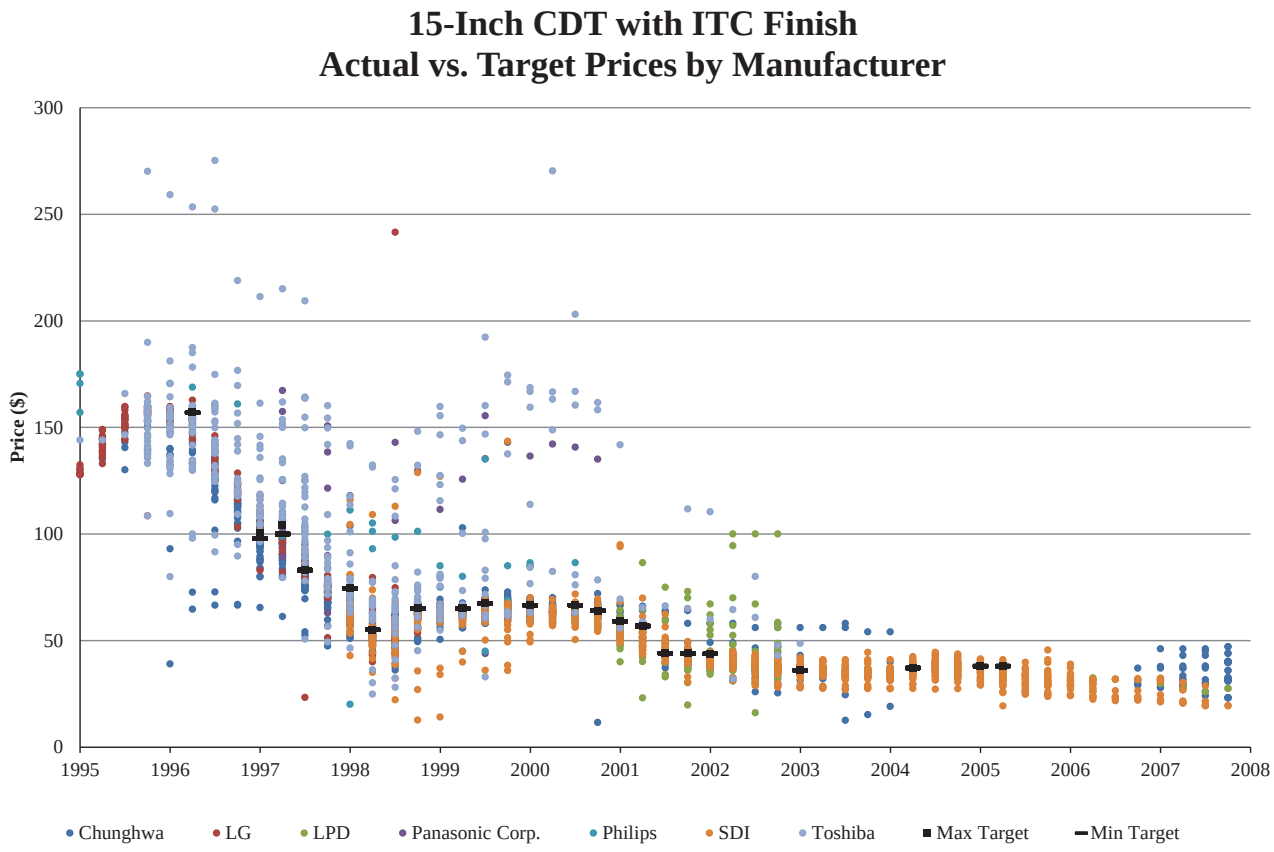
Figure 15

14-Inch CDT with ITC Finish
Actual vs. Target Prices by Manufacturer



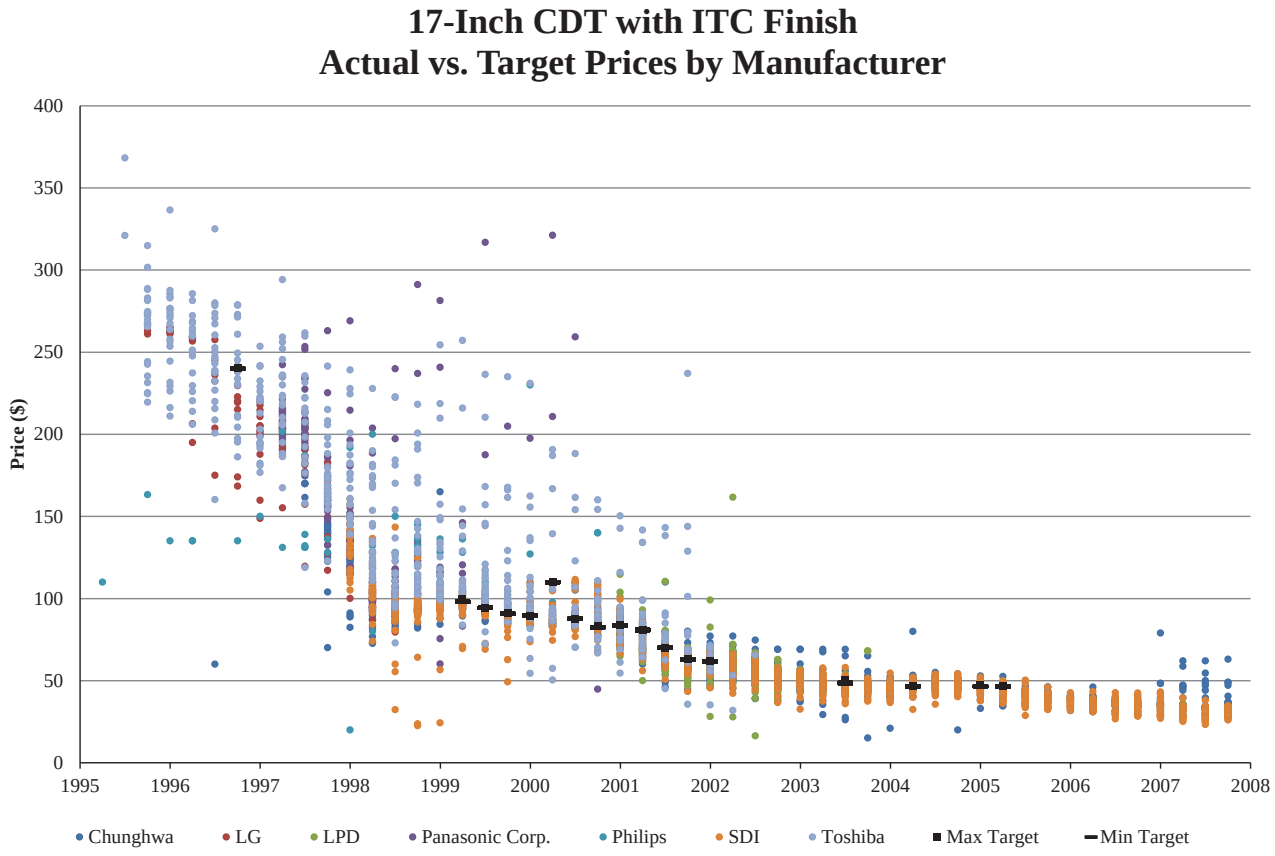
Note(s): Dr. Netz's sales database inappropriately labels Panasonic Corp. as MTPD.
Data source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibit 64.
Cartel meeting notes; see Target price-structure.xlsx.
Source file(s): combine_target_defendant.dta; p010_target_price_regressions.do - actual v target.do; a010_target_price_regressions.do - actual v target.xlsx

Figure 16



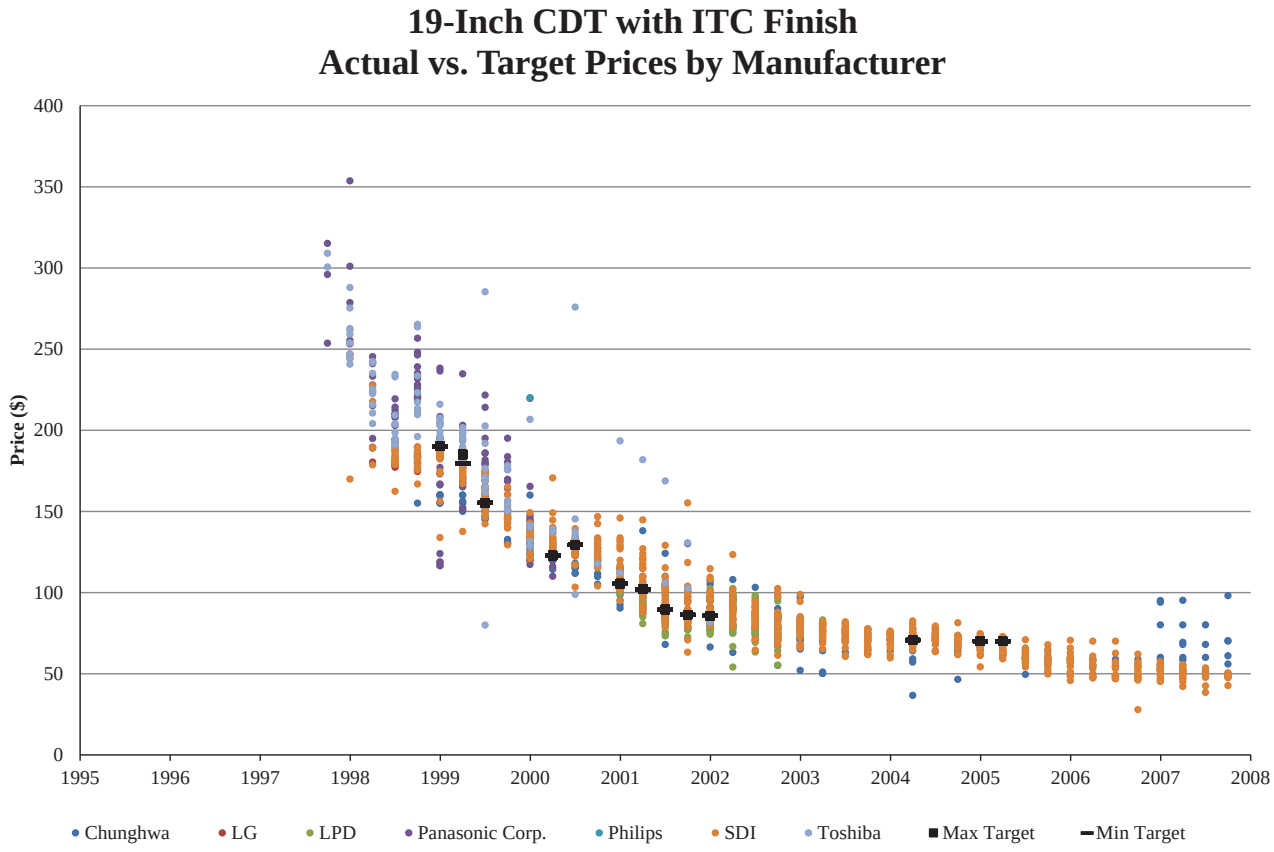
Note(s): Dr. Netz's sales database inappropriately labels Panasonic Corp. as MTPD.
Data source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibit 64.
Cartel meeting notes; see Target price-structure.xlsx.
Source file(s): combine_target_defendant.dta; p010_target_price_regressions.do - actual v target.do; a010_target_price_regressions.do - actual v target.xlsx

Figure 17



Note(s): Dr. Netz's sales database inappropriately labels Panasonic Corp. as MTPD.
Data source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibit 64.
Cartel meeting notes; see Target price-structure.xlsx.
Source file(s): combine_target_defendant.dta; p010_target_price_regressions.do - actual v target.do; a010_target_price_regressions.do - actual v target.xlsx

Figure 18



Note(s): Dr. Netz's sales database inappropriately labels Panasonic Corp. as MTPD.
Data source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibit 64.
Cartel meeting notes; see Target price-structure.xlsx.
Source file(s): combine_target_defendant.dta; p010_target_price_regressions.do - actual v target.do; a010_target_price_regressions.do - actual v target.xlsx

70. While Dr. Netz argues that: "The prices charged by Defendants closely tracked the collusive target prices,"[103] she ignores the fact that even for the minority of CDT sales that arguably were covered by target prices, Defendants frequently priced below those target prices. Specifically, I have estimated that approximately 80 percent of CDTs sold worldwide for which Dr. Netz identified an alleged applicable target price were priced below that target price.[104] Moreover, even this very substantial 80 percent figure under-estimates the extent to which Defendants priced below target prices because (as Dr. Netz has acknowledged) target prices were more frequently set with respect to relatively basic CDT models rather than more differentiated models which would generally have higher prices.[105]

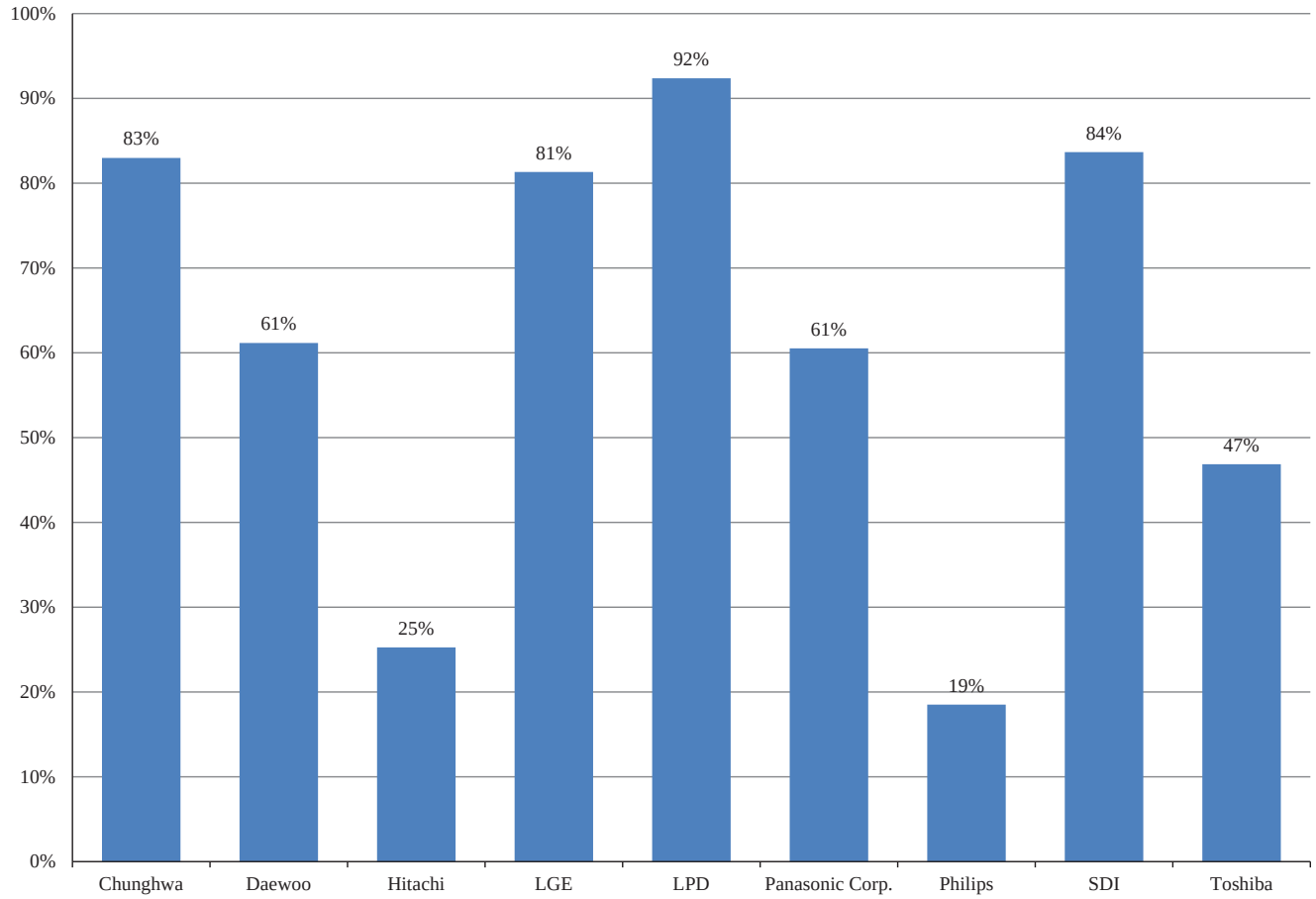
71. Dr. Netz's data also indicate that the percentage of sales below target varied substantially across CDT manufacturers. See Figure 19. This further undermines Dr. Netz's conclusions that CDT manufacturers adhered in a uniform way to the alleged target prices. To the extent that there were substantial differences across

[103] Netz Expert Report, at 64.
[104] See my backup file "Share of CDT Sales Quantity Below Target Price by Year.xlsx."
[105] Netz, Janet S., Ph.D., 15 February 2013, Declaration of Janet S. Netz, Ph.D., in Support of Motion of Indirect-Purchaser Plaintiffs for Class Certification (hereafter "Netz Initial Class Report"), at 63.

manufacturers in the extent of adherence to target prices, we would have expected substantial punishments and/or side payments. However, Dr. Netz provides little evidence of such punishments being carried out, and no evidence of such side-payments.[106]

Figure 19[107]

Share of CDT Sales Quantity Below Target Price



72. The data also show that widespread pricing below target prices continued throughout the alleged conspiracy. For example, Table 3 below shows that the large majority of sales remained below target prices even during 2003-2005. Accordingly, there is no evidence that the alleged conspiracy was able to increase adherence substantially over time.

[106] Despite the widespread evidence of non-adherence to target prices, Dr. Netz reports only a small number of instances where punishment allegedly was threatened. Netz Expert Report, at 57-58. Moreover, she provides no evidence that any such punishments actually were carried out, despite the fact that evidence of non-adherence to target prices continued throughout the alleged conspiracy period. See Table 3.

[107] See my backup file "share_sales_below_target_by_manufacturer.csv."

Table 3[108]

Share of CDT Sales Quantity Below Target Price by Year

Year	Below Target
1996	58.9%
1997	71.1%
1998	89.8%
1999	76.7%
2000	80.5%
2001	83.7%
2002	78.5%
2003	82.0%
2004	73.3%
2005	89.7%
Overall:	**80.5%**

73. CDT price *changes* often differed substantially from contemporaneous changes in target prices. In Figure 20, I plot quarterly changes in actual sales prices for those sales where Dr. Netz claims to have found a match to a target price. The horizontal axis depicts quarterly changes in the alleged target prices identified by Dr. Netz, and the vertical axis depicts corresponding changes in actual sales prices of CDT models for the same time period. In calculating these price changes, I used disaggregated sales data in which an actual price observation represents the quantity-weighted average actual price for a given model, customer, factory, and quarter using Dr. Netz's global CRT sales data for Q1 1995 to Q4 2007.[109] Similarly, a target price observation represents the average of the target prices identified by Dr. Netz for the same combination of manufacturer, application (CDT/CPT), size, finish, and quarter.

74. If actual prices followed target prices closely as Dr. Netz alleges, most observations in the figure would be located close to the 45-degree line indicating that an actual price change was equal to the change in Dr. Netz's alleged applicable target price. In contrast, most of the data points are widely dispersed rather than clustered tightly around the 45-degree line. For each specific target price change on the x-axis, there is a wide range of corresponding actual price changes. It is not uncommon that the actual price even changes in the opposite direction of the target price change. This demonstrates that even though the chart only depicts actual prices for which Dr. Netz has identified a matching target price, changes in actual prices for CDTs differed widely from changes in the alleged applicable target prices. This substantial deviation of actual from target prices, along with the differentiation among CDT products, undermines Dr. Netz's claims of a highly effective conspiracy. Such variation would have made it difficult for individual cartel members to: a) conform their prices to alleged target

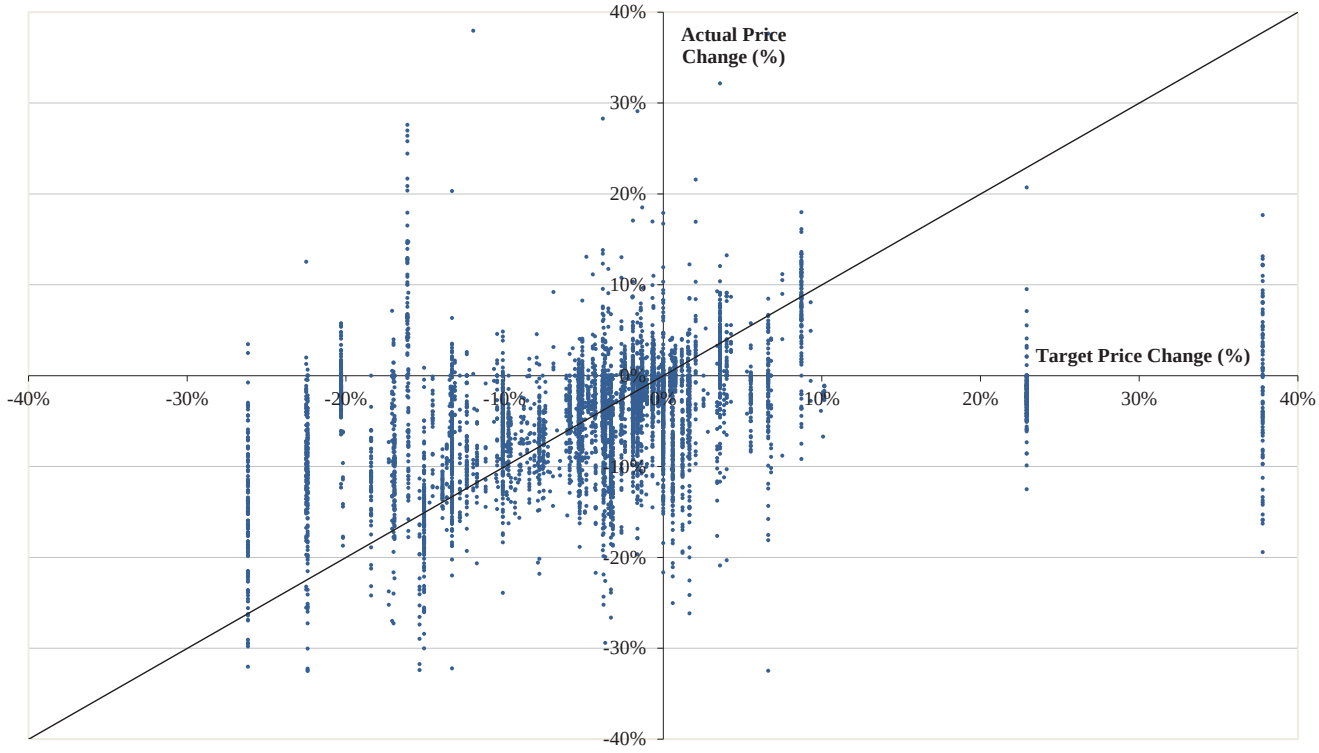
[108] See my backup file "Share of CDT Sales Quantity Below Target Price by Year.xlsx."

[109] I have reviewed the analysis of target prices in the reports of Dr. Netz and Dr. Willig from the class certification stage of the CRT litigation, and taken them into consideration in my analysis in this report.

prices, b) compare actual prices to the target prices, making it more difficult to detect which firms were not complying with the alleged cartel, and c) to punish any perceived "cheaters." [110]

Figure 20[111]

Changes in Actual CDT Prices vs. Changes in Target Prices By Model, Customer, Factory, and Quarter



Sources:
(1) Global CRT sales data for Chunghwa, Daewoo, Hitachi, IRICO, LGE, LPD, Mitsubishi, MTPD, Panasonic Corporation, Philips, SDI, Samtel, Thai CRT, Thomson, and Toshiba Corp.;
(2) Netz target price data.

Similar charts for particular sizes of CDTs are provided in Appendix E. As shown by the example for 15 inch CDTs shown below, these charts also indicate that changes in actual CDT prices varied widely from changes in target prices, and also varied substantially across individual CDT manufacturers.

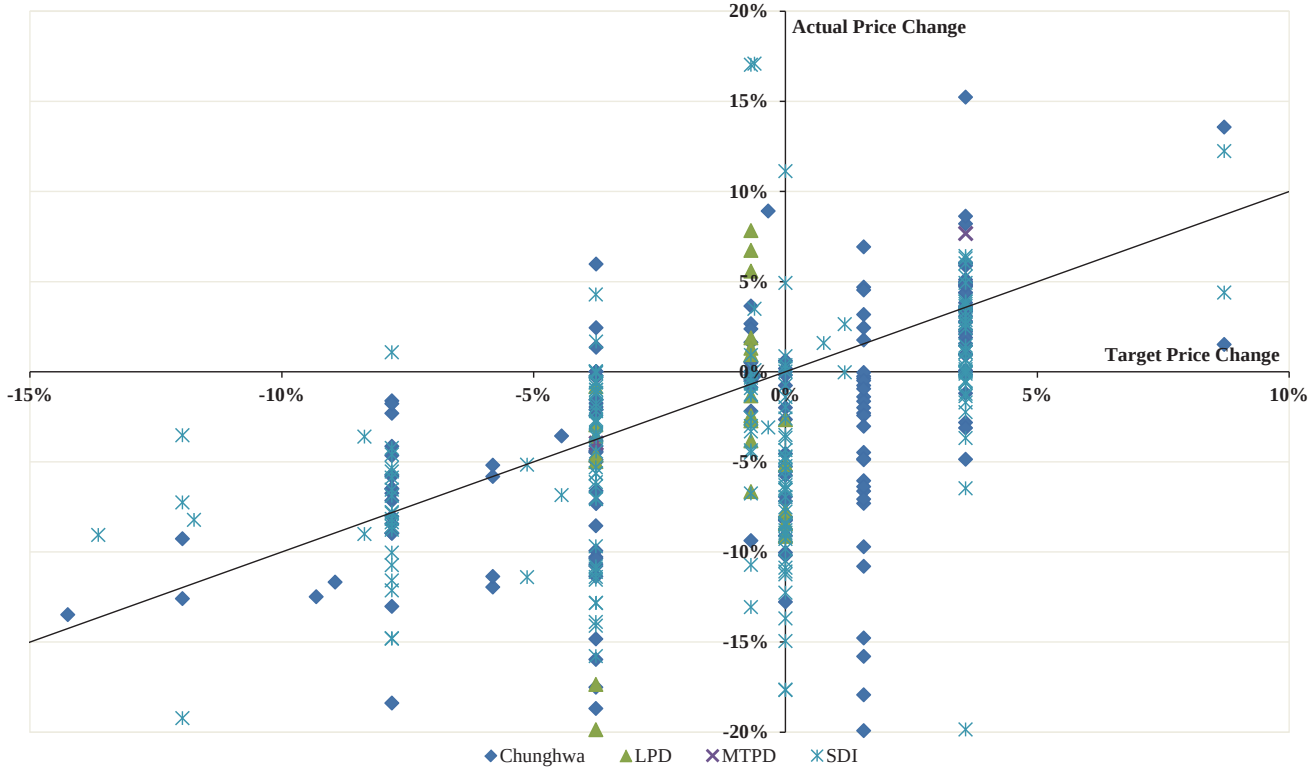
[110] As discussed above, the economic literature on cartels indicates that collusion generally is more difficult when products are heterogeneous and prices are difficult to observe and monitor. See, e.g.,

- Grout, Paul A., & Sonderegger, S. M. I. A. (2005). *Predicting Cartels (OFT 773)*. Office of Fair Trading, at 15.
- "Cartel agreements are easier to enforce if detecting violations is easy. Four factors aid in the detection of cheating: There are few firms in the market. -Prices do not fluctuate independently. -Prices are widely known. -All cartel members sell identical products at the same point in the distribution chain." … "If a market has frequent shifts in demand, input costs, or other factors, prices in that market have to adjust often. In that case, cheating on a cartel arrangement may be difficult to detect, because it cannot be distinguished easily from other factors that cause price fluctuations. Cheating is easier to detect if prices are known." Carlton & Perloff, at 136-137.

[111] See my backup file "Changes in Actual CDT Prices vs. Changes in Target Prices.xlsx."

Figure 21

15-Inch CDT Actual and Target Price Changes by Manufacturer



Note(s): Price changes represent the compounded quarterly percentage change for a given manufacturer, factory, customer, and finish between quarters *t* and *t-x*, where *x* is defined as the smallest positive integer for which there were actual prices and target prices for the panel in quarters *t* and *t-x*. That is, the actual and target price changes were calculated over the same period of time, and *x* represents the shortest period over which this was possible. Excludes observations for which the model number, customer name, size, or finish were missing or with more than four quarters between observed pairs of actual/target price changes. A number of observations are outside the bounds of the x or y axis.
Dr. Netz's sales database inappropriately labels Panasonic Corp. as MTPD.

Data Sources(s): Defendant data; see Expert Report of Janet S. Netz April 15, 2014, Exhibit 64.

Source File(s): combine_target_defendant.dta; p051_actual_v_target_price_mfg_size.do; a051_actual_v_target_price_mfg_size.xlsx

75. An econometric analysis of the data also confirms the conclusions from Figure 21 and shows that changes in actual CDT prices vary widely from changes in allegedly applicable target prices. In particular, I estimated a regression of the actual change in CDT prices for each quarter on the corresponding change in the target price for all sales for which Dr. Netz was able to assign a target price. The coefficient of the target price variable in this regression was .24 indicating that a 1% increase in the target price is associated with only a 0.24% increase in the actual CDT price (on average) during the same quarter. Moreover, changes in target prices explain only a small percentage of the total variation in changes in the actual prices for corresponding CDTs from quarter to quarter as the R- squared statistic was only 0.126.[112]

[112] I have also run a number of "robustness" checks on these regressions using different explanatory variables. See Appendix F. I find the same general results in all of these models.

Table 4[113]

Change in CDT Actual Price Regressed on Change in Target Price & Controls

VARIABLES	(1)	(2)	(3)
Delta Target Price	0.237***	0.231***	0.224***
	(0.00791)	(0.00793)	(0.00798)
Delta OECD Unemployment		0.0954***	0.0729***
		(0.00857)	(0.00920)
Delta OECD Industrial Production		2.003***	2.237***
		(0.114)	(0.119)
Delta CRT Glass Price		0.159***	0.139***
		(0.0240)	(0.0242)
Delta Monitor LCD Share			0.360***
			(0.0548)
Constant	-0.0343***	-0.0398***	-0.0493***
	(0.000880)	(0.00117)	(0.00186)
Observations	6,225	6,225	6,225
R-squared	0.126	0.185	0.190

Standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

76. I also estimated a similar regression model of changes in actual and target prices to analyze how well changes in Dr. Netz's index of average CDT target price changes explain changes in the actual prices of CDTs for which Dr. Netz was not able to identify target prices. Dr. Netz argues that there would still be a strong relationship between these prices because she believes there was a "price structure" that linked the prices of different types of CDTs to one another in a stable and reliable way.[114] To the contrary, I find that quarter-to-quarter changes in the target price index created by Dr. Netz have little ability to explain contemporaneous quarterly changes in actual CDT prices. As shown in Table 5, the regression has an R-squared statistic of only .004, indicating that the target price index explains less than one percent of the variation in changes in the actual prices for non-targeted CDTs over the same pair of quarters. Similarly, the coefficient of the change in target prices of -.0342 indicates that a 5% increase in the target price index created by Dr. Netz is actually associated with a very small (-0.2%) decrease in non-targeted actual prices during the same quarter.

[113] See my backup file "Change in CDT Actual Price Regressed on Change in Target Price.xlsx."
[114] See, e.g.,
- Netz Expert Report, at 66-72.
- Netz Class Cert Declaration, at 65.

Table 5[115]

Change in CDT Actual Price Regressed on Change in Target Price

VARIABLES	(1)
Delta Target Price Index	-0.0342**
	(0.0110)
Constant	-0.0395***
	(0.00194)
Observations	2,486
R-squared	0.004

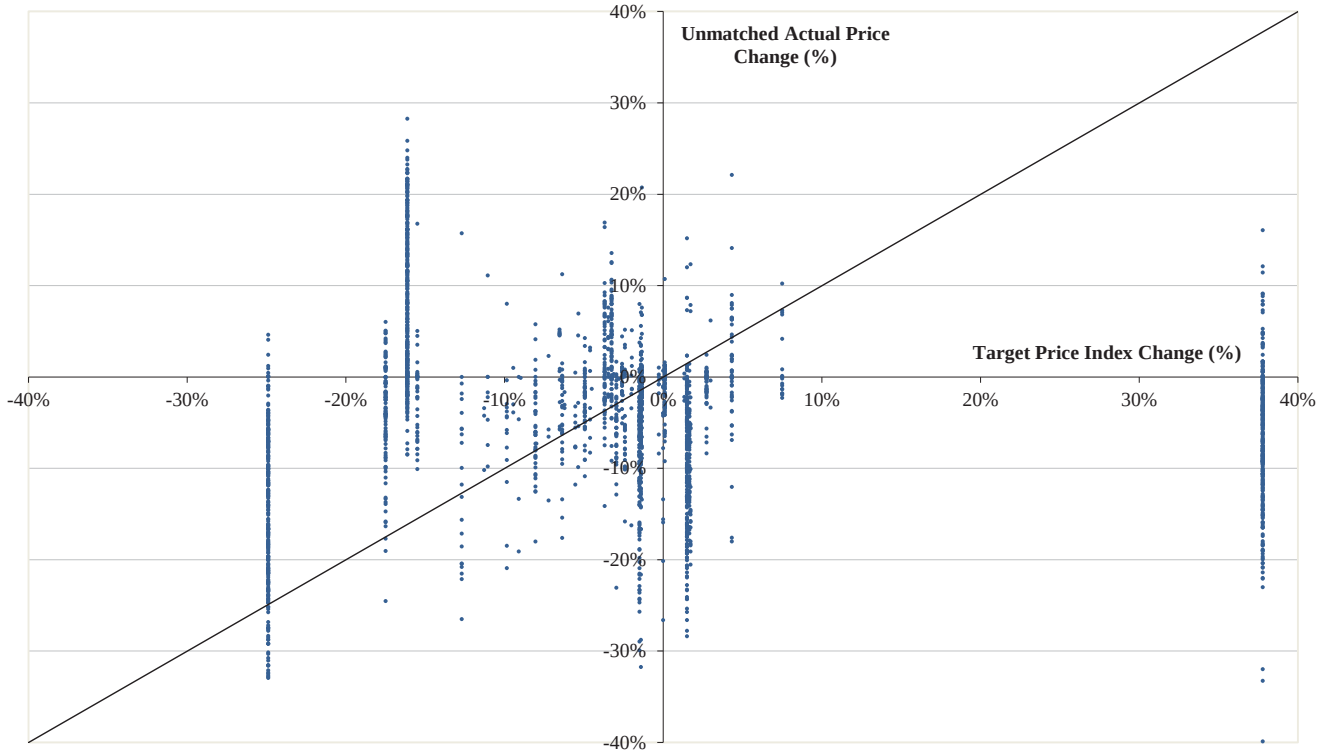
Standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

77. The inability of changes in target prices reliably to statistically explain changes in non-targeted actual prices is further illustrated in Figure 22 below. This chart is analogous to Figure 20 above, except that the actual sales are ones for which Dr. Netz was not able to match a target price and, accordingly, the horizontal axis represents contemporaneous changes in the target price index created by Dr. Netz for analysis of non-targeted CDT models. Once again, the chart shows wide variation in the magnitude of actual price changes for any given change in target prices. It is not uncommon that the actual price even changes in the opposite direction of the target price change. Very few actual price changes lie along or closely clustered to the 45° line in the chart which would indicate an actual price change equal to the target price change.

[115] See my backup file "Change in CDT Actual Price Regressed on Change in Target Price Index.xlsx."

Figure 22[116]

CDT Unmatched Actual Price Change vs. Target Price Index Change By Model, Customer, Factory, and Quarter



Sources:
(1) Global CRT sales data for Chunghwa, Daewoo, Hitachi, IRICO, LGE, LPD, Mitsubishi, MTPD, Panasonic Corporation, Philips, SDI, Samtel, Thai CRT, Thomson, and Toshiba Corp.;
(2) Netz target price data.

78. Dr. Netz also presents an econometric analysis in her Exhibit 37 that purports to show that target CDT prices are good predictors of actual CDT prices. However, rather than looking at quarter to quarter changes, as in the charts and regression analyses discussed above, Dr. Netz's analysis is based on the levels of CDT prices in each quarter. In particular, she regresses the level of the actual CDT price for a given product in a given quarter on the target price that she assigns to that CDT product for the same quarter, as well as the actual price in the prior quarter, the price of glass and a number of macroeconomic variables. She claims that this regression constitutes a "direct test of whether the cartel *affected* the prices of CRTs…" (Emphasis added) She also claims that her regression analysis provides: "clear evidence that the cartel's activities increased the price for CRTs for which the cartel set targets."[117]

79. However, neither of these claims is economically valid. First, Dr. Netz's econometric analyses of actual and target prices at most show correlation between actual prices and target prices. Moreover, if manufacturers have some ability to make use of market supply and demand information to estimate where their prices should be one or two months in the future, and similar information was used to inform target prices, then there will be some correlation between actual prices and target prices – albeit with a great deal of "noise" and variation. These relationships do not show that target prices caused actual prices to be substantially higher than they would have

[116] See my backup file "CDT Unmatched Actual Price Change vs. Target Price Index Change.xlsx."
[117] Netz Expert Report, at 65.

been absent the alleged setting of target prices. In the longer run, target and actual prices are driven by the same underlying economic forces of supply and demand for CDTs. The control variables that Dr. Netz included in her regression capture some of these factors, but do not capture all of the relevant market forces. Accordingly, one would expect to observe a positive relationship between actual and target prices even if target prices played no role in actually determining the prices that each manufacturer actually sets. In economic jargon, to the extent that both actual prices and target prices are affected by similar economic factors that are not fully controlled for in Dr. Netz's regression models, there will be spurious correlation between the actual and target prices.[118]

80. Spurious correlation between actual prices and target prices also is exacerbated in Dr. Netz's analysis of price levels because some target prices were based on contemporaneous actual prices. In fact, Dr. Netz states that one major category of target prices was a "maintenance price" where the goal of the target is simply to maintain the current actual price level.[119] If target prices frequently were set even partly based on actual prices, then one would expect to find a positive relationship between actual prices and target prices even if target prices did not have any causal impact on future actual prices.

81. As introduced above, yet another reason that Dr. Netz's regression analysis does not demonstrate that target prices caused actual prices to be higher than they would otherwise have been stems from the fact that individual CDT manufacturers likely had some information about future trends in CDT prices based on their normal participation in the market and knowledge of supply and demand factors in the marketplace other than that provided by the target prices. As they manage their business, firms collect market information on a continuous basis and use such information to form expectations about future prices. For example, each firm may know what orders it has received from its major customers for the next few months and may track how such demand levels compare to the same quarter in prior years. Such information can give individual CDT manufacturers some incremental ability to estimate what CDT prices are likely to be over the next month or two compared to a simplistic forecast based for example only on the prior month's actual prices and the additional variables in Dr. Netz's regression model. Accordingly, to the extent that target prices reflect some of the information in such manufacturer estimates, they will tend to reflect incremental information beyond that reflected in the actual price in the prior quarter and the other variables in Dr. Netz's model. However, the fact that target prices may reflect such information does not imply that they cause future actual prices to move to the level of the target price. Similarly, the fact that some macroeconomic models might have some ability to predict future GDP movements does not imply that those forecasts are causing the subsequent changes in GDP.[120]

82. In addition, even if there were some causal relationship between the levels of target prices and actual prices as Dr. Netz claims, there remain significant limits on the ability of CDT target prices to statistically predict actual CDT price levels. For example, statistical analysis indicates that there is a statistical probability of more

[118] This spurious correlation between actual and target prices is mitigated in the analysis of quarter to quarter changes since there are fewer changes in these left out variables over shorter time horizons, and the changes in these variables are not as large as they would be over a longer time period.

[119] See, e.g.,

- Netz Expert Report, at 49-50.
- See also, e.g. 23 February 2005, CHU00608095.01E - CHU00608105E, at 8096.02E.

[120] These same criticisms are fully applicable to Dr. Netz's Exhibits 30-32 and the conclusions she draws from those exhibits that "[t]he prices charged by Defendants closely tracked the collusive target prices." Netz Expert Report, at 64. These exhibits also do not indicate that CDT target prices were effective in raising actual CDT prices above the levels that would have occurred absent the setting of the target prices. In addition, the experience of continually declining CDT prices shown in these exhibits and the corresponding frequent downward revisions in the "target prices" of the alleged cartel shown in these exhibits, illustrate the limits to any alleged cartel's ability to control actual CDT prices.

than 65 percent of making an error of 10 percent or more when predicting actual CDT prices based on target prices. In other words , even looking at sales of CDTs for which Dr. Netz was able to match target prices, actual prices would have a roughly 66% probability of being 10 percent different than the target prices (and an even higher probability (over 82%) of being at least 5 percent different than the target price).[121] This high rate of prediction error is consistent with the results on quarterly price changes shown above and indicates that it would be difficult for CDT manufacturers to accurately monitor one another's pricing and adherence to the alleged target prices. Moreover, individual manufacturers would actually have had a much more difficult time than implied by this regression analysis since they would have far less detailed data than contained in Dr. Netz's price databases and would be attempting to monitor such pricing for many different types of products, competitors and customers in real time.

83. Moreover, the same statistical analysis described above shows even larger prediction errors when I apply it to products for which Dr. Netz was not able to assign a target price. The analysis indicates that there is a statistical probability of approximately 94% of making an error of 5% or more and a probability of 88% of making an error of 10 percent of more when predicting actual CDT prices based on Dr. Netz's target price indexes.[122]

84. As discussed above, Dr. Netz argues that it was not necessary for the CDT manufacturers to set target prices for all products because the prices of different sizes and types of CDTs were strongly linked to one another through a stable "price structure."[123] To the contrary, the evidence presented above indicates that prices for different types and sizes of CDTs often moved differently from one another, rather than always staying in a common "price structure" during the alleged conspiracy and that new models were being introduced at significantly different rates across sizes of CDTs. Dr. Netz also argues that her opinions regarding such a "price structure" are supported by a "hedonic pricing model" that analyzes the relative prices of different types and sizes of CDTs and how those prices are related to underlying product characteristics. See Netz Exhibit 40. I have estimated similar CDT hedonic models to those used by Dr. Netz for individual years from 1995 – 2008. The coefficients of the different size categories in these regressions allow me to illustrate how price differences for different sizes of CDTs vary over time while controlling for other factors that may have affected the prices of these products. For example, these regressions indicate that the price premium of a 15 inch CDT over a 14 inch CDT varied from a high of 46.1% in 1995 to a low of 4.4% in 2002. The premium for a 17 inch CDT over a 15 inch CDT varied from a high of 105.4% in 1997 to 20% in 2008.[124]

85. The hedonic price regressions also demonstrate that price differentials varied significantly across manufacturers during the alleged conspiracy. For example, the differential in prices of SDI over Chunghwa (controlling for other factors using Dr. Netz's data and hedonic regression approach) varied from a high of 4.6%

[121] See my backup file "prediction_error_matched_products.csv."

[122] See my backup file "prediction_error_unmatched_products.csv." Moreover, even if actual prices and target prices exhibit a significant positive relationship, it was shown below that a majority of actual CDT prices were below the alleged target prices.

[123] See, e.g.,

- Netz Expert Report, at 66-72.
- Netz, Janet S., Ph.D., 01 October 2013, Declaration of Janet S. Netz, Ph.D., In Support of Motion of Indirect-Purchaser Plaintiffs for Class Certification, In re: Cathode Ray Tube (CRT) Antitrust Litigation, at 65.

[124] See my backup file "size_premium_CDT.xlsx."

in 2001 to a low of -6% in 2007.[125] Similarly, the differential of Toshiba Corp. over SDI based on the hedonic model varied from a high of 11.2% in 1998 to -27% in 2002. These results cast doubt on Dr. Netz's use of her hedonic model to support her conclusions about conspiracy effectiveness. The fact that hedonic price differentials between manufacturers change substantially over time provides evidence that prices certainly did not move in lock-step across manufacturers. Such diverse price movements would have significantly complicated the monitoring of compliance with target prices by individual manufacturers.

86. Consistent with the foregoing empirical analysis, many of the defendants' internal documents also are consistent with frequent perceived "cheating" or non-adherence to target prices.[126] These documents also indicate that the defendants frequently experienced difficulties in monitoring one another's pricing and often did not trust the information that their competitors reported in meetings.[127]

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[125] Manufacturer premiums were calculated by running regressions similar to those reported in Exhibit 40 of the Netz Expert Report, but separately for each year, without the seller-buyer dummies and weighted by quantity. See my backup file "mfr_premium_CDT.xlsx."

[126] See, e.g.,

- Regarding SDD:
  - "With its full size, production capacity expansion and global supply advantages, Samsung ambitiously wants to expand its territory. It will definitely grab strategic customers like ACER, PHILIPS, $60.00 (S/S), also offer $62.00(S/S) to the medium customers. Have impact on CPT's order." 24 February 1997, CHU00028763 - CHU00028767, at 8763.01E.
  - "In addition to snatching orders from PH, ACER, SDD also offered CDT - $2 to L-ON. Even though it already enjoys a higher market share among small and medium sized customers, it still offered $60 as the bottom price. Unless the upper level of SDD asked its SALES to restrain their behaviors of grabbing orders, with the order loss for CDT, it is feared that a vicious battle with SDD will be unavoidable." 24 February 1997, CHU00028763 - CHU00028767, at 8763.02E.
  - "Mr. Moon [Orion] claimed that he believed that SDD had strong ambitions to expand M/S, and that its major strategy is to 'kill the competing makers'. So he was suspicious about SDD's attitude toward holding prices." CHU00028952 - CHU00028954, at 8954E.
- "The Korean makers not only took away orders from the Japanese makers, but also drove the Taiwanese makers to the wall!" 13 October 1999, CHU00030888 - CHU00030893, at 0888.01E.
- Regarding pricing agreements, Mr. Song states that "[a]lthough there was a discussion regarding the agreement, but after such meeting we went ahead and acted based on our own opinion. I don't believe we can use the term 'agreement' here." 12 December 2012, Deposition of In Hwan Song, Volume 1, at 120:16-19.
- "Regarding the second-phase price increase, LPD raised serious doubts about SDI. Not only did SDI engage in questionable practices toward small customers such as Delta, the price to SEC was essentially never increased, so there are strong objections against continued cooperation." "Hundreds and thousands of excuses, only making it more obvious that SDI has been hiding actual numbers. SDI admitted by its silence that the disclosed numbers do not reflect actual performance, and LPD openly confessed at the meeting that the numbers they disclosed at the meetings were false[...]" 26 May 2004, CHU00031249 - CHU00031252, at 1249.02E-1250E.
- Other examples include, CHU00028803 - CHU00028804, at 8803.02E; CHU00014202 - CHU00014206, at 4203E; CHU00031249 - CHU00031252, at 1249.02E; CHU00028728 - CHU00028729, at 8729E; CHU00028763 - CHU00028767, at 8764E; CHU00071480 - CHU0071482, at 1481E; CHU00028604 - CHU00028605, at 8604.01E-8605E; CHU00030888 - CHU00030893, at 0888.01E; CHU00028952 - CHU00028954, at 8954E; 12 December 2012, Deposition of In Hwan Song, Volume 1, at 120:16-19 and 13 December 2012, Deposition of In Hwan Song, Volume 2, at 191:12-14.

[127] See, e.g.,

- Deposition of Deok-Yun Kim:
  - At the manufacturer meetings, Mr. Kim of SDI mentions that the future prices submitted by SDI were not accurate, and he also thought "that the prices that were submitted by competitors would not be accurate." 27 March 2013, Deposition of Deok-Yun Kim, Volume 1, at 31:17-18.

C. Evidence on CDT capacity and output

87. As discussed above, CDT capacity and output grew very rapidly during the early years of the alleged cartel (until about 2000). While CDT capacity was tight in 1995, a number of the defendants' internal documents indicate that the rapid growth in capacity and output led to substantial excess capacity in the years after 1996.[128] As shown in Figure 13 the excess capacity led to vigorous price competition and rapidly declining prices, particularly during mid-1996 through mid-1998.[129] These data are inconsistent with claims of effective output

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- Mr. Kim suspects that they received false information in return: "there were instances where I knew and there were other instances [...] where I did not know." 28 March 2013, Deposition of Deok-Yun Kim, Volume 2, at 324:23-25.
- He continues to say, "when it came to price or production figures, I believe that there was little trust among all of the participants…" 28 March 2013, Deposition of Deok-Yun Kim, Volume 2, at 325:9-12.
- Mr. Kim does recall that his subordinates provided future pricing information to other CRT manufacturers. 27 March 2013, Deposition of Deok-Yun Kim, Volume 1, at 35:22-36:4.
- He also recalls competitors suggesting future prices, but that he believes "that those information was false information." 27 March 2013, Deposition of Deok-Yun Kim, Volume 1, at 36:16-20.
- When asked whether Mr. Kim's superior, Mr. In Kim, knew of the false information SDI provided at meetings, Mr. Kim responded: "Mr. In Kim already had a rough understanding about the nature of such meetings." 28 March 2013, Deposition of Deok-Yun Kim, Volume 2, at 331:12-16.

- Deposition of Hoon Choi:
  - Regarding the passing of information Mr. Choi states: "I kept giving them [the] wrong information, and I think they also gave me the wrong information, and continuously the three companies talked lies to each other." 20 June 2013, Deposition of Hoon Choi, Volume 2, at 234:15-18.
  - He goes on to state that "everything was fabricated," however, to keep his competitors believing the information he provided was factual, "[he] tried to adjust within the boundary of [his] knowledge" of what the actual figures were. 20 June 2013, Deposition of Hoon Choi, Volume 2, at 265:10-13.
- Deposition of In Hwan Song from SDI:
  - Regarding the reliability of the figures shared during the meetings, Mr. Song from SDI states, "what I did was to provide the information which was different from the actual data. Therefore, I actually did not put much trust in the information I received from those meetings." 14 December 2012, Deposition of In Hwan Song, Volume 3, at 284:9-12.
  - As Mr. Song discusses, "the numbers [SDI] submitted were vastly different from the actual numbers. [SDI], in turn, did not expect that the competitors were providing us with the exact numbers." 12 December 2012, Deposition of In Hwan Song, Volume 1, at 121:12-15.
  - The information Mr. Song did receive he used to "have [a] better understanding about the market and customers." 14 December 2012, Deposition of In Hwan Song, Volume 3, at 285:6.
- Other examples include: 20 June 2013, Deposition of Hoon Choi, Volume 2, at 209:21-23 and 211:11-233:6; 11 September 2013, Deposition of Jun Yeol Youn, Volume 1, at 39:11-25 and 12 September 2013, Deposition of Jun Yeol Youn, Volume 2, at 284:5-16; CHU00031249 - CHU00031252 at 1249.02E; and CHU00028728 - CHU00028729 at 8729E.

[128] See, e.g. PHLP-CRT-090615; CHU00028933 - CHU00028945; TSB – CRT 00036829; HDP-CRT00055162; LPD-NL00018267 - LPD-NL00018336; SDCRT-0201291; TAEC-CRT-00065484, TET-CRT-00003403. "By Toshiba's calculations, capacity equaled output in 1995 and thereafter exceeded output by 19% in 1996, 31% in 1997, 37% in 1998, 35% in 1999, and 27% in 2000." Netz Expert Report, at 20.

[129] See, e.g.,

- [redacted]

control during this period. No CDT conspiracy that could effectively control the capacity and output of its members would knowingly create such substantial excess capacity and such rapidly declining prices.

88. In addition, economic evidence shows that the rapid expansion in industry output and subsequent changes to capacity (additions of new lines, line modifications to change CDT size, shape or other characteristics, changes in location, etc.) does not have the attributes of effective coordination. Most obviously, firms such as SDI, LG and Chunghwa improved their products and expanded their capacity and output much more aggressively than their competitors, leading to substantial shifts in market share, both overall and for individual sizes of CDTs. See Figures 2-6. The fact that capacity and output grew so rapidly during this period combined with the fact that shares changed substantially casts great doubt on Dr. Netz's claims that collusive output restriction had any significant effect on prices during the period prior to 2000.

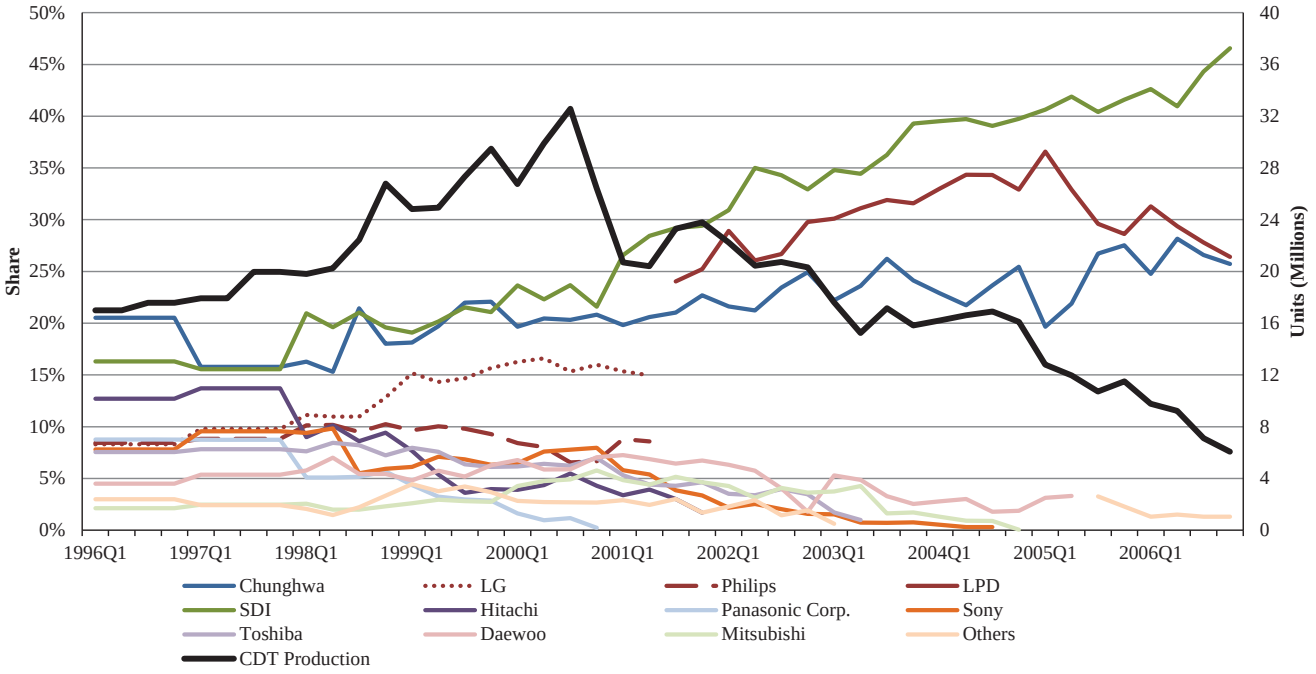
89. Moreover, as discussed above CDT market shares continued to change substantially even after 2000 when CDT demand was declining and some firms were exiting. For example, Figure 7 shows that during the period from 2000Q1 to 2006Q4 SDI increased its share by roughly 23 percentage points while Chunghwa gained roughly 6 percentage points. LPD's share fluctuated significantly over this period, ending up with a gain of approximately 3 percentage points. The gains experienced by these firms came largely at the expense of Hitachi, Mitsubishi, Daewoo, Toshiba Corp. and Sony, each of whom lost between four and seven percentage points of market share during this period. Several of these firms actually exited the CDT industry during this period.[130]

- Dr. Netz agrees that the balance between CDT demand and capacity was an important determinant of CDT prices when she emphasizes the role of excess capacity in causing declines in CDT prices. However, she makes the critical error of assuming that substantial excess capacity existed throughout the alleged conspiracy period. Netz Expert Report, at 5, 19-20. In fact, as discussed in detail in Section III below, several non-collusive factors contributed to supply shortages during 1995, a critical period for Dr. Netz's estimated overcharges.

[130] It is my understanding that the Hitachi Defendants ceased manufacturing CDTs by December 2001 and CPTs by April 2002, and ceased selling CDTs by October 2002 and CPTs by March 2003. It is also my understanding that Panasonic Corporation stopped manufacturing CDTs in 2000 and had exited the CDT business by 2001. 12 March 2014, Deposition of Allen Chang, Volume 1, at 35:25-36:15. A 2004 LPD document stated: "Over the past two years, competitors in CDTs have been ceasing their CDT production, including Matsushita, Hitachi, Toshiba, Sony and Teco. Mitsubishi has announced that it will cease CDT production in 2004. Orion is understood to be having financial difficulties and has reduced its production lines from 3 to 1." LPD-NL00173522 – LPD-NL00173655 at 3588.

Figure 23

CDT Quarterly Production Shares and Total Industry Production (1996Q1-2006Q4)



Note(s): 1996 and 1997 quarterly shares from annual production shares.
Data source combines LG and Philips under the heading of "LPD."
Because LPD was not formed until July 2001, LG, Philips, and LPD are separated for the purposes of this chart.
For periods before the July 2001 LPD formation, "LPD" separated into "LG" (Korea) & "Philips" (Taiwan).
2001 Q1 and 2001 Q2 "LPD" production shares split into "LG" and "Philips" according to relative production volumes of LG and Philips for the first half of 2001.
Manufacturer production data for 2004Q1 unavailable. 2004Q1 production calculated as the average of 2003Q4 and 2004Q2 production.
Plaintiffs' dataset inappropriately labels Panasonic Corp. as MTPD.

Data Source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibit 82.

Source File(s): total production.do; total production.xlsx; HDP-CRT00019322_rough_translation.xls; SDCRT-0201291.dta; CHU00071226.XLS; chu00071226.dta; mtpd-0416090.dta; vendor_map.do; vendor_map.xlsx; vendor_map_def.dta; vendor_map_name.dta; CDT data.xlsx; p004_pdn_mfg_shares_2006.do; a004_pdn_mfg_shares_2006.xlsx

90. Despite this evidence of independent action and competition, Dr. Netz cites contemporaneous documents from meetings purporting to show that defendant manufacturers agreed to collusively restrict output by shutting down particular CDT lines either temporarily or permanently at various times. However, the fact that some defendants shut down production lines does not prove collusive output restriction if the lines allegedly shut down would have sat idle and/or would have been shut down anyways whether such meetings had occurred or not. There are many reasons having nothing to do with collusion why individual CDT manufacturers may have decided to reduce output or shut down particular production lines at various points in time.

91. Most obviously, many of Dr. Netz's examples of alleged capacity and output control are taken from periods of substantial excess capacity for CDTs such as the post-2000 period when CDT demand was declining rapidly. It is not surprising that CDT manufacturers would seek independently to rationalize their manufacturing facilities and reduce their output during this period in light of substantial excess capacity and declining demand for CDTs.[131] For example, LPD documents from this time frame discuss several line closures in the context of

[131] Dr. Netz appears to have agreed with this point: "Q. And is it correct that in such an industry without any collusion declining demand could lead to decisions to idle or close capacity? A. Yes. Q. Okay. Have you done any analysis to determine how much capacity would be closed without any alleged collusion in this industry versus how much capacity was closed over time? A. No." Netz Deposition, at 141:18-142:1.

reducing costs and rationalizing LPD's own global capacity.[132] This is particularly true if CDT lines can profitably be converted (with necessary time and investment) to other uses such as CPT production.[133]

92. In addition to declines in the level of CDT demand over time, changes in the composition of CDT demand in terms of demand shifts to larger sizes of CDTs and CDTs with flatter screens, shorter necks, higher resolution or other improved characteristics could also necessitate reductions in capacity and output for certain CDT lines. For example, it makes economic sense that many 14" and 15" production lines would be cut back or shut down as the demand shifted from 14 and 15 inch CDTs to larger sizes over time.[134] Figure 24 illustrates the changes in the mix of capacity by size over time for the industry as a whole, and Figure 25 shows similar data for an individual manufacturer, SDI.[135]

[132] A 2009 document about LPD discusses CPT and CDT plants:

- "However, quite soon after LPD's formation it already became apparent that in 2001 the CRT market, especially the market for CDT products, had deteriorated much more than had been taken into account at LPD's formation. In order to cope with these disappointing developments, at a meeting held on 27 October 2001 the Supervisory Board instructed the Executive Board to restructure more aggressively than initially foreseen at the formation. ... The object of these new plans had to be (a) to reduce within two to three years the number of employees by about 15,000, (b) to close half of all factories and (c) to dispose of the glass, yoke and fly-back activities. ... In 2001 the factories of LPD in Dapon (CDT and guns) and Chungli (DU factory), both situated in Taiwan, were closed. ... Early in February 2002 the revised restructuring plan for LPD, which complemented or extended the earlier plans, was presented and submitted for approval by the Executive Board to the Supervisory Board. In outline the adjusted plan provided, on the one hand, in the closure of the former Philips factories in Chupei (Taiwan), Ottawa (USA) and Lebring (Austria) and, on the other hand, in the divestment of the former Philips factory in Barcelona and of all Yoke Ring and Fly-back activities. ... As a result of the restructuring measures the number of employees at the end of the year 2002 would have to be reduced by about 5,600. All this should largely be completed in 2002. The Executive Board foresaw in February 2002 that the revised restructuring plan for LPD would require an amount of USD 300 million in costs. ... In addition to the plans for the closure and divestment of factories, early in 2002 the Executive Board also had developed plans to: a) increase the factory loading of LPD in 2002 from 75% to 88% for CPT and for CDT from 71% to 87%; b) improve the factory efficiency of LPD in 2002 from 81% in 2001 to 84% in 2002." A.A.M. Deterink, Investigation of the Causes of the Bankruptcy of LG.Philips Displays, 20 April 2009, at 155-157.
- "Finally, early in 2003 LPD set itself the target, on the one hand, to increase in 2003 the factory loading for both CPT and CDT to 90% and, on the other hand, to improve in 2003 the factory efficiency from 79% to 83%." A.A.M. Deterink, Investigation of the Causes of the Bankruptcy of LG.Philips Displays, 20 April 2009, at 161.

[133] LPD 2004 annual report indicated that "In 2004, we had to close down our CPT facility in Aachen, Germany, and our glass plant in Simonstone, UK, while we also had to reduce our CDT exposure Nanjing, China by partly converting production lines toward CPT. We further announced in December 2004 that we will close two lines in Dreux, France. These moves, though painful, are crucial to help us align our production capacity with market demand and maintain a worldwide cost-competitive position in the long term." LPD-NL00214381 - LPD-NL00214444, at 4388. Similarly, a 2003 document reports that Chunghwa converted one of its Malaysia CRT lines from CDT to 14-inch CPT. Philips, 06 February 2003, Global C-CRT Line Status, PHLP-CRT-015235. See also Netz Report Exhibit 3.

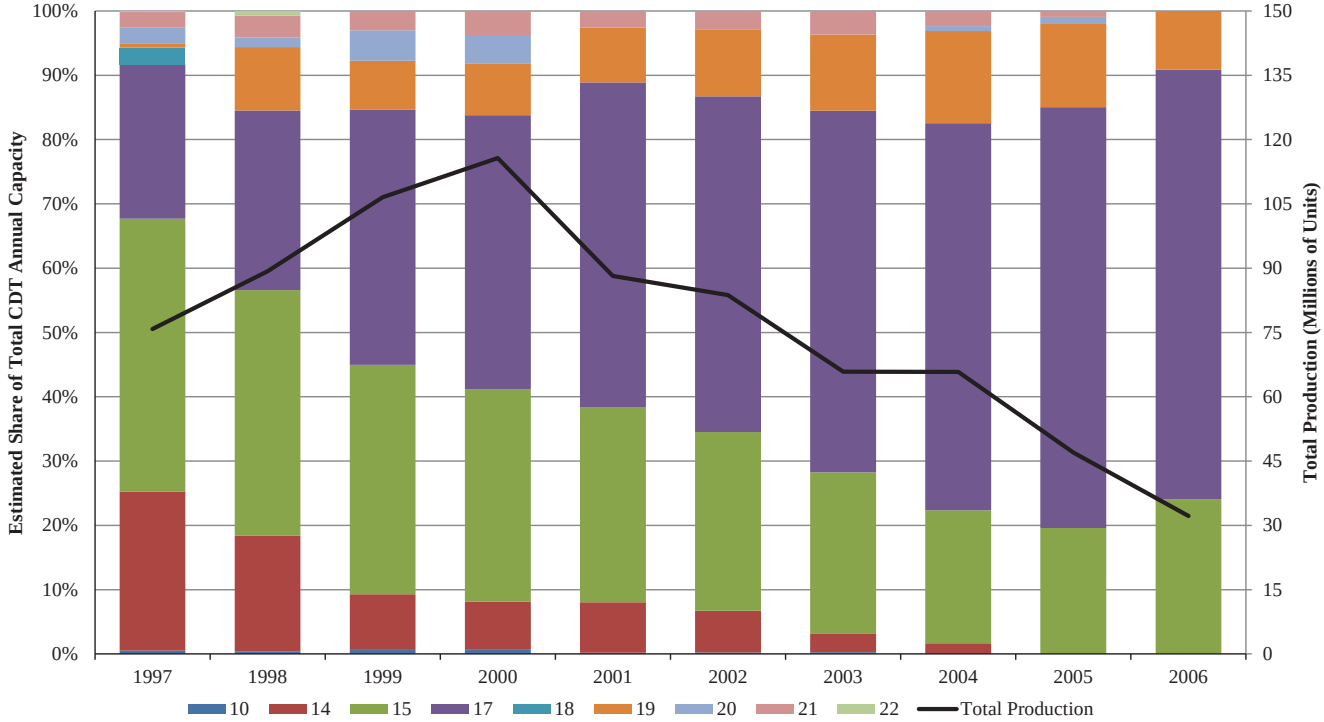
[134] See, e.g.,

- A 2003 document shows SDI converting a 17-inch CDT line to a 21-inch CPT line in October 2002. The same line status report also shows Chunghwa converting a line of CDT to CPT production. PHLP-CRT-015235.
- In addition, BGDC 1998-2002 Strategy review stated "CAPEX has been 'allocated' based on product portfolio. For this review period CAPEX for capacity extension is limited to WS products (including Real Flat) in Europe and Large Sizes in South America (conversion 20" line)." LPD-NL00018253–LPD-NL00018266, at 8264.

[135] Similar charts for other manufacturers can be found in Appendix G.

Figure 24

Total CDT Annual Production and Estimated Size Composition of Total CDT Annual Capacity



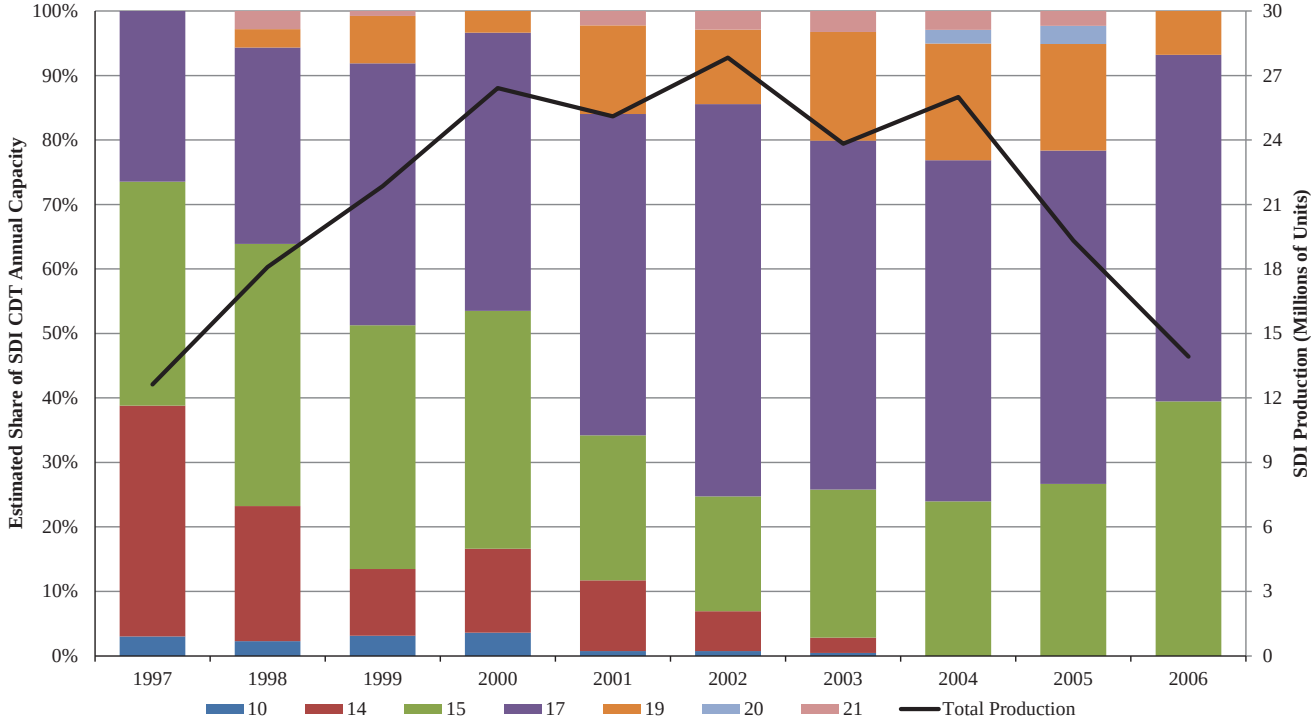
Note(s): Manufacturer production data for 2004Q1 unavailable. 2004Q1 production calculated as the average of 2003Q4 and 2004Q2 production.
Source data reports total CDT capacity by line and date. Capacity for a given size calculated as total capacity divided by number of sizes for given line and date.
CDT capacity identified by prefix "D:" in the "products" field from Dr. Netzs' backup file "capacity_db_linetype.dta."
For a given date, capacity assumed to be zero if none reported.

Data Source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibits 2 and 82.

Source File(s): total production.do; total production.xlsx; HDP-CRT00019322_rough_translation.xls; SDCRT-0201291.dta; chu00071226.dta; mtpd-0416090.dta; vendor_map.do; vendor_map.xlsx; vendor_map_def.dta; vendor_map_name.dta; p004_pdn_mfg_shares_2006.do; t004_CDTpdn_tot_sdi_cpt_oec.dta; capacity_db_linetype.dta; CDT data.xlsx; p006_capacity_db_linetype_mfg_size.do; a006_capacity_db_linetype_mfg_size.xlsx

Figure 25

SDI CDT Annual Production and Estimated Size Composition of SDI CDT Annual Capacity



Note(s): Manufacturer production data for 2004Q1 unavailable. 2004Q1 production calculated as the average of 2003Q4 and 2004Q2 production.
Source data reports total CDT capacity by line and date. Capacity for a given size calculated as total capacity divided by number of sizes for given line and date.
CDT capacity identified by prefix "D:" in the "products" field from Dr. Netz's backup file "capacity_db_linetype.dta."
For a given date, capacity assumed to be zero if none reported.

Data Source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibits 2 and 82.

Source File(s): total production.do; total production.xlsx; HDP-CRT00019322_rough_translation.xls; SDCRT-0201291.dta; chu00071226.dta; mtpd-0416090.dta; vendor_map.do; vendor_map.xlsx; vendor_map_def.dta; vendor_map_name.dta; p004_pdn_mfg_shares_2006.do; t004_CDTpdn_tot_sdi_cpt_oec.dta; capacity_db_linetype.dta; CDT data.xlsx; p006_capacity_db_linetype_mfg_size.do; a006_capacity_db_linetype_mfg_size.xlsx

93. Other internal documents indicate that new CDT lines were added or existing lines were upgraded to produce flat CDTs rather than curved CDTs during time periods when Dr. Netz claims that CDT capacity and production were being collusively restricted.[136] Similarly, internal documents show that a number of existing CDT lines in high-wage Asian countries were shut down to be relocated to lower wage Asian countries to reduce costs and increase competitiveness. See also Figure 26.[137] These diverse changes in capacity and output that

[136] See, e.g.,

- A 2003 document shows LG adding a 19-inch flat CDT line in April 2002, SDI adding 17-inch flat CDT lines in August 2001, and Chunghwa adding a 21-inch flat CDT line in March 2002. 06 February 2003, PHLP-CRT-015235.
- "While current forecasts show the 17" CRT market to make a quick move to 17" Flat, price sensitive markets like Latin America which are still showing some grow with flat CDT production outpacing 17" curved CDT production in Q1'06 7/3, if the market does not move to 17" flat then the marginal Q/Q revenue gain shown for Q3'06 will not be realized." Q2'06 Quarterly Desktop Monitor Shipment and Forecast Report, Final Edition, July 24, 2006, Display Search.

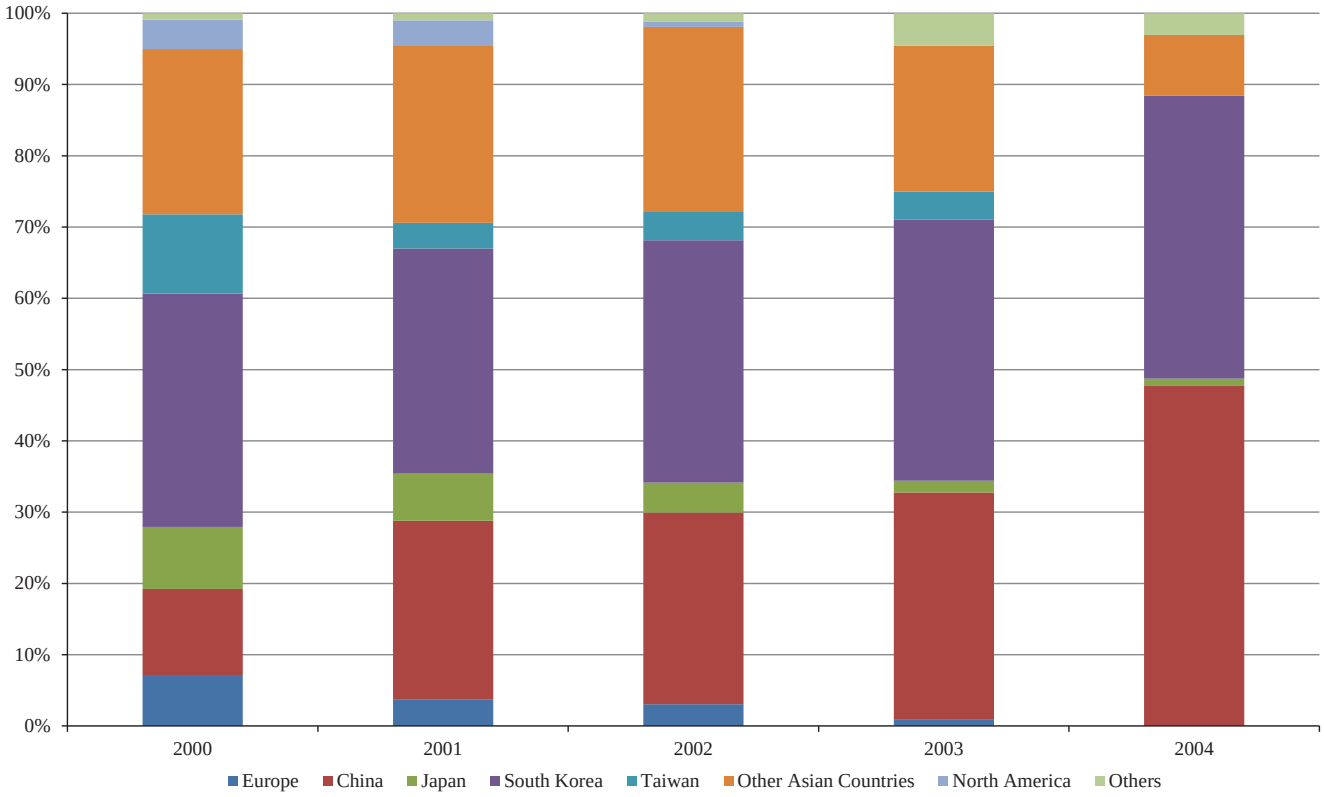
[137] See, e.g.,

- A 2003document shows Chunghwa moving several CDT lines from Taiwan and Malaysia to mainland China, SDI moving a CDT line from Malaysia to China, and LG moving a CDT line from Korea to China. PHLP-CRT-015235.
- "Japanese companies, facing of stiff competition, trade barriers, and relatively slow growth in developed countries, are continuing their drive to relocate production to East Asia. Production facilities in the developing countries of Asia offer not only lower production costs but also facilitate entry into new markets. In late 1992, NEG (Malaysia)

varied across CDT manufacturers and over time reflect that CDT manufacturers were responding to changes in CDT demand in deciding which lines to expand and which to shut down over time.[138] Moreover, this type of diverse conduct would make it more difficult for the alleged conspiracy to effectively coordinate on capacity and output since firms likely would have to coordinate on the particular types of capacity to be shut down.

Figure 26

CDT Annual Production Distribution by Region (2000-2004)



Note(s): Shares based on production value denominated in Japanese yen.
Data Source(s): Fuji Chimera Research Institute, Inc. and InterLingua, "Flat Panel Display Applications: Trends and Forecasts," editions 2001-02 and 2004-06.
Source File(s): 2001_CRT sections.pdf; 2002_CRT sections.pdf; 2004_CRT sections.pdf; 2005_CRT sections.pdf; 2006_CRT sections.pdf; a011_cdt_pdn_region_fuji_chimera.xlsx

94. In addition, even if multiple CDT manufacturers did shut down some CDT lines, total industry output may not have been reduced if these manufacturers (or other manufacturers) offset any lost output from a closed

began investing in the production of glass bulbs for CRTs. Samsung of Korea has also established a picture tube plant in Malaysia. By 1996, the Malaysian market is expected to have grown to 8.8 million bulbs for CRTs annually. Toshiba has set up facilities in Thailand to produce color television tubes for its Far East plants. Vietnam and China are also locations in Asia attractive to CRT producers." Industry & Trade Summary, Television Picture Tubes and Other Cathode-Ray Tubes, USITC Publication 2877, May 1995.

[138] "In order to keep pace with more demanding computer applications, CRTs have been continually improved: larger screen sizes, higher resolution (for Windows, Macintosh OS, and Web-page font challenges), and higher luminance (for videos). This improvement is likely to continue, as the market moves away from sales of smaller (14-inch and 15-inch) monitors, toward 19-inch and 21-inch monitors." Mizuki, Colleen and Gloria Schuldt, "Computer Display Industry and Technology Profile," U.S. Environmental Protection Agency, 744-R-98-005, December 1998.

CDT line with increased production at other facilities. To the extent that there remained substantial excess capacity even after the alleged collusive line shutdowns (as Dr. Netz alleges[139]), such reallocations of production likely would have been feasible. For all of these reasons, proving a successful collusive restriction of industry output that significantly raises market prices requires much more than providing examples of individual production lines that allegedly were shut down, particularly during a period of declining demand.

95. The fact that collusive output restriction cannot be inferred from individual line or plant shutdowns also is consistent with the fact that industry competitors that are not alleged to have been participants in the alleged conspiracy were also reducing capacity and output substantially during much of the alleged cartel period. In fact, Sony (a non-defendant) reduced both capacity and production by a substantially greater amount than many of the companies that appear frequently in Dr. Netz's examples of alleged output restriction. See Figures 6-9. Obviously, Sony was reducing its output during this period because it made independent business sense to do so.

96. The same point also can be illustrated with data from Dr. Netz's Exhibit 28, which purports to summarize the participation of CDT manufacturers in cartel meetings that resulted in capacity or production control agreements. The alleged participation in these meetings varied significantly across different CDT manufacturers. In particular, while Dr. Netz claims that Chunghwa, LG, Orion, Philips, SDI and LPD were frequent participants in such meetings, other manufacturers such as Hitachi, Mitsubishi, and Toshiba Corp. do not appear in Dr. Netz's exhibit at all. Other manufacturers such as Irico and Pansonic Corporation appear only once.

97. Given this substantial variation in alleged participation rates across manufacturers, we would expect that these alleged agreements would have reduced the production and capacity of the participating firms relative to that of firms who are not alleged to have participated. In contrast, the evidence directly contradicts this proposition, demonstrating substantial cheating or other non-adherence to the alleged agreements. For example, Figure 27 shows quarterly CDT production for Dr. Netz's alleged participating group versus the non-participating group. Contrary to the implication of Dr. Netz's allegations, the group of allegedly participating manufacturers shows substantially greater relative growth in output than that of the nonparticipating manufacturers. Accordingly, rather than restricting their output, these manufacturers were increasing output substantially relative to manufacturers who are not alleged to have participated in these meetings. As shown in Figure 28, we obtain similar results if we do the same analysis using capacity rather than production.

[139] "I found that the CRT industry was a so-called 'sick industry'; that is, there was falling demand and excess capacity throughout the damages period." Netz Expert Report, at 5.

Figure 27

CDT Quarterly Production Indices
Grouped by Alleged Participation in CDT Cartel Meetings



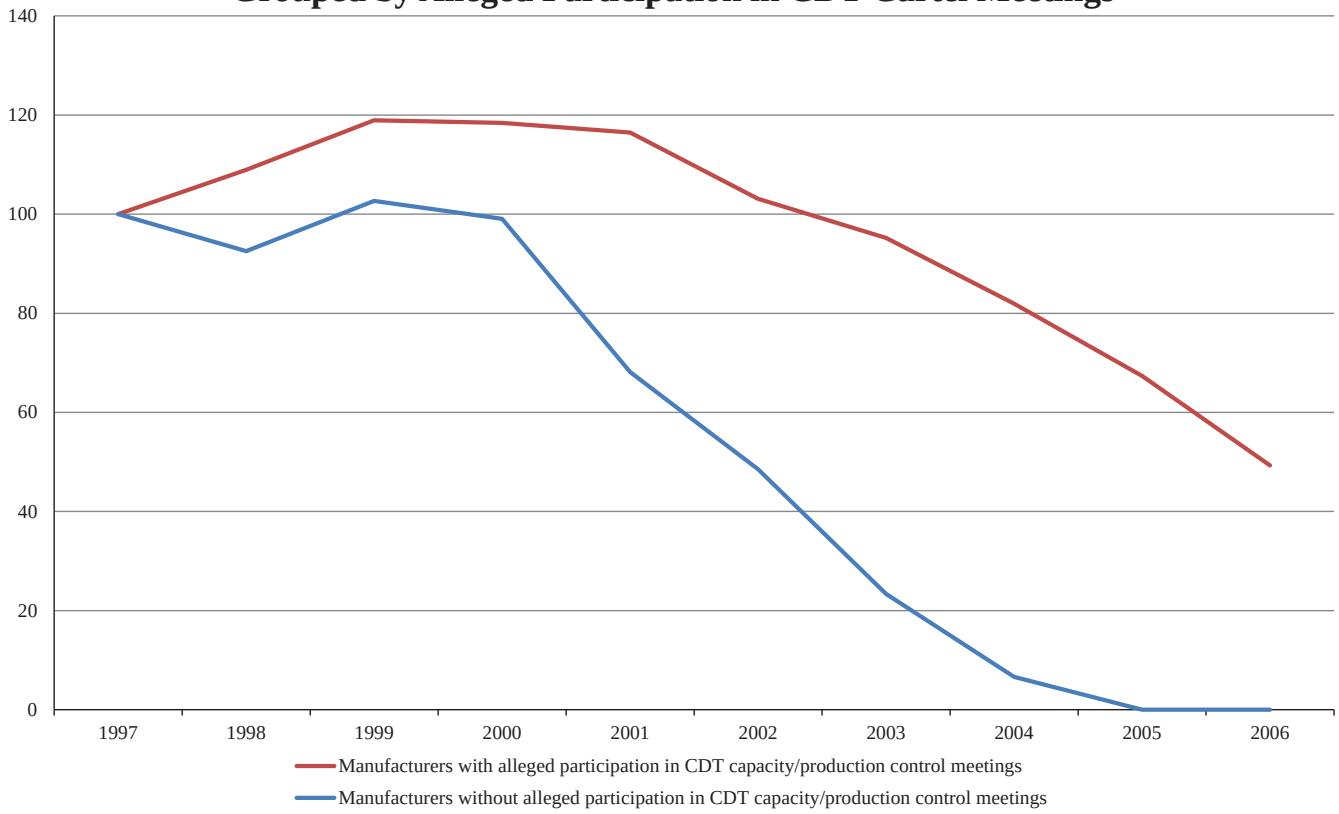
Note(s): Base period for both indices is 1996Q1. 1996 and 1997 manufacturer shares from annual production shares.
Manufacturer production data for 2004Q1 unavailable. 2004Q1 production calculated as the average of 2003Q4 and 2004Q2 production.

Data Source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibits 28 and 82.

Source File(s): total production.do; total production.xlsx; HDP-CRT00019322_rough_translation.xls; SDCRT-0201291.dta; chu00071226.dta; mtpd-0416090.dta; CDT data.xlsx; vendor_map.do; vendor_map.xlsx; vendor_map_def.dta; vendor_map_name.dta; p004_pdn_mfg_shares_2006.do; a004_pdn_mfg_shares_2006.xlsx

Figure 28

CDT Annual Capacity Indices
Grouped by Alleged Participation in CDT Cartel Meetings



Note(s): Base year for both indices is 1997.
Data Source(s): Defendant data; see Expert Report of Janet S. Netz April 15, 2014, Exhibits 2 and 28.
Source File(s): capacity_database.dta; p007_capacity_shares.do; a007_capacity_shares.xlsx

98. Similarly, as discussed in Section IV below, when we relax Dr. Netz's implausible assumption that overcharges were uniform across the entire 2Q1995-4Q2006 period, we find that the vast majority of the "overcharges" implied by the Netz model occur in 1995 and 1996, years for which there are essentially no allegations of production or output control in Dr. Netz's report. Estimated overcharges for the years 1997 through 2007, when the vast majority of Dr. Netz's alleged output restrictions occur, are generally small and not statistically significant.

D. Evidence related to CDT market shares and claims of market allocation

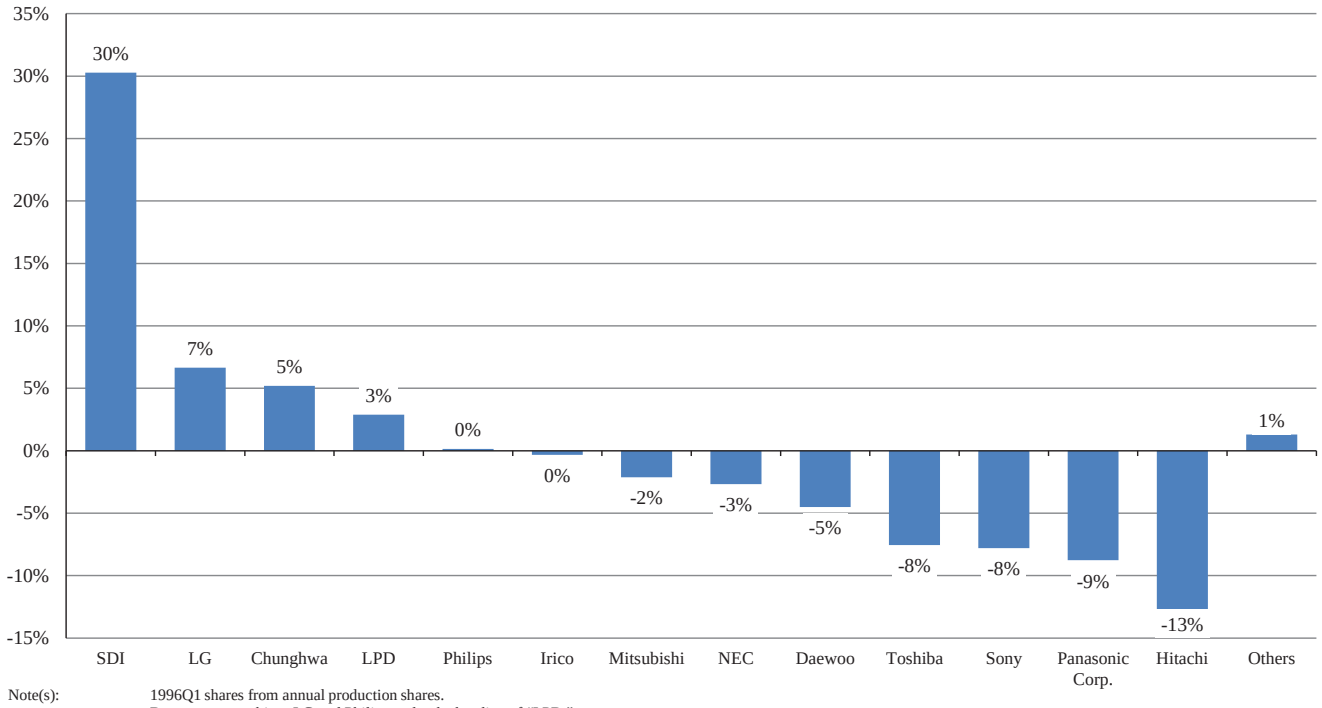
99. Dr. Netz argues that the defendant manufacturers engaged in two types of market allocation: a) Targets for market shares of aggregate CDT production or sales; and b) Allocation of specific large customers (or shares of sales at specific customers). Economics indicates that the goal of such mechanisms would be to reduce the ability of individual manufacturers to increase their sales at the expense of their competitors by "cheating" on the alleged collusive agreements. To the extent that such mechanisms were successful we would expect that they would have tended to stabilize market shares among the defendant manufacturers. However, as discussed above, the available evidence suggests that there were substantial changes in market shares during the periods that Dr. Netz claims these mechanisms were being employed. These substantial changes in market shares continued

throughout the alleged conspiracy period, both during the pre-2000 period when demand for CDTs was growing rapidly, and the post-2000 period when demand was declining.[140]

100. In particular, firms such as SDI, CPT, LG and LPD expanded capacity and output much more aggressively than their rivals and gained substantial market share. Other alleged conspirators, notably the Japanese manufacturers, lost substantial market share. Several of these manufacturers eventually exited the industry completely.[141] As discussed in more detail in Section II above, if we look at production during the entire 1996Q1 to 2006Q4 time period as a whole, we see that SDI had by far the largest share gain with 30 percentage points followed by LG at seven percentage points and Chunghwa at five percentage points. The largest share losers were Hitachi at -13%, Pansonic Corporation at -9% and Sony and Toshiba Corp. at -8%. See Figure 29. These substantial changes in market shares of various competitors (including the different timing of firms' exit decisions) undermine Plaintiffs' and Dr. Netz's allegations that the defendants successfully colluded on market shares, capacity and output.

Figure 29

Change in CDT Quarterly Production Shares from 1996Q1 to 2006Q4



Note(s): 1996Q1 shares from annual production shares.
Data source combines LG and Philips under the heading of "LPD."
Because LPD was not formed until July 2001, LG, Philips, and LPD are separated for the purposes of this chart.
For periods before the July 2001 LPD formation, "LPD" separated into "LG" (Korea) & "Philips" (Taiwan).
Change in shares calculated as difference between 2006Q4 and 1996Q1 shares unless noted otherwise below.
Change in LG shares and Philips shares calculated as difference between 1996Q1 and 2001Q2 shares.
Because LPD was not formed until 2001Q3 out of combination of LG and Philips, the change in LPD share calculated relative to LG and Philips' combined 2001Q2 share.
Hitachi's change in CDT quarterly production share only represents 1996Q1 through 2001Q4, as the Hitachi Defendants ceased manufacturing CDTs in December 2001.
Data Source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibit 82.
Source File(s): total production.do; HDP-CRT00019322_rough_translation.xls; SDCRT-0201291.dta; chu00071226.dta; mtpd-0416090.dta; CDT data.xlsx; vendor_map.do; vendor_map.xlsx; vendor_map_def.dta; vendor_map_name.dta; p004_pdn_mfg_shares_2006.do; a004_pdn_mfg_shares_2006.xlsx

[140] As discussed in Section II above, the economic literature on cartels indicates that collusion generally is more difficult in dynamic industries when supply and demand conditions and competitor market share are changing over time.

[141] It is my understanding that the Hitachi Defendants ceased manufacturing CDTs by December 2001 and CPTs by April 2002, and ceased selling CDTs by October 2002 and CPTs by March 2003.

101. Dr. Netz appears to dismiss the evidence on changes in market shares and argues that economic theory indicates that shifting market shares are consistent with an effective and stable cartel.[142] While a variety of different market share patterns potentially can be consistent with collusion as a matter of economic theory, the balance of the economic evidence in this case supports the view that the substantial share gains of firms such as SDI (and to a lesser extent LG, LPD and Chunghwa) were, on balance, a major factor inconsistent with, and that acted to undermine the effectiveness of alleged collusion. For example, numerous contemporaneous documents such as those discussed in the following paragraphs indicate that the defendant manufacturers frequently did not trust one another and believed some firms such as SDI were frequently expanding their share by "cheating" on alleged agreements. This evidence is consistent with the basic economics of collusion which suggests that significant changes in CDT market shares make it less likely that effective collusion occurred for several reasons. Most obviously, Dr. Netz alleges that the defendant manufacturers engaged in a variety of mechanisms to restrict output including allocations of market share and individual large customers. From an economic perspective, the goal of these alleged mechanisms would be to "share" the economic costs and benefits of collusion relatively equally among the participating manufacturers and prevent individual manufacturers from cheating on the agreements by increasing their sales at the expense of other manufacturers. Substantial share changes indicate that these objectives were not realized. [143] In addition, as discussed in Section II above, changing shares make it more difficult for cartel members to determine whether one or more firms are cheating on a price fixing agreement or have experienced increased sales for some other reason. In addition, many of the models in the literature where market share changes are part of the collusive agreement involve some form of compensation or side payments among the conspirators, for which I am aware of no evidence in the CDT industry.[144]

102. As noted above, our analysis has the benefit of extensive review of data and information made available from a number of defendant companies by product size on actual prices, sales and production (across multiple products) [from this we observe significant changes in shares and production – and changes for a given manufacturer over time. In contrast, the alleged conspiracy had significantly less clarity into contemporaneous actions or planned versus implemented actions. Defendants' deposition testimony and internal documents indicate that they often did not provide truthful information about prices, capacity, output and market shares in the meetings. As a result, CDT manufacturers often did not trust the information they received from competitors in meetings.[145] These problems increased the difficulty the manufacturers experienced in monitoring one another's sales and/or market shares, and they often engaged in disputes over these issues.[146]

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[142] Netz, Janet S., Ph.D., 15 February 2013, Rebuttal Declaration of Janet S. Netz, Ph.D., In Support of Motion of Indirect-Purchaser Plaintiffs for Class Certification, In re: Cathode Ray Tube (CRT) Antitrust Litigation, at 28-30.

[143] See, e.g.:

- George J. Stigler (1964), "A Theory of Oligopoly," *Journal of Political Economy* 72(1) at 46.
- "Second, does the industry display volatile turnover over a sustained period of time? Cartels are more likely if output and market conditions are normally stable." Grout and Sonderegger (2005, at 15).

[144] One paper concluded that "interfirm sales or other forms of compensation, as the use of asymmetric punishments is essential to effective collusion (a point originally made by Harrington and Skrzypacz 2007)." Joseph E. Harrington and Andrzej Skrzypacz (2011), Private Monitoring and Communication in Cartels: Explaining Recent Collusive Practices, *American Economic Review*, 101(6): 1-25, at 18.

[145] See, e.g.,

- Deposition of Hoon Choi:
    - Regarding the passing of information Mr. Choi states "I kept giving them [the] wrong information, and I think they also gave me the wrong information, and continuously the three companies talked lies to each other. 20 June 2013, Deposition of Hoon Choi, Volume 2, at 234:15-18.

- He goes on to state that “everything was fabricated,” however, to keep his competitors believing the information he provided was factual, “[he] tried to adjust within the boundary of [his] knowledge” of what the actual figures were. 20 June 2013, Deposition of Hoon Choi, Volume 2, at 265:10-13.

- Deposition of In Hwan Song:
  - Regarding the reliability of the figures shared during the meetings, Mr. Song from SDI states, “what I did was to provide the information which was different from the actual data. Therefore, I actually did not put much trust in the information I received from those meetings.” 14 December 2012, Deposition of In Hwan Song, Volume 3, at 284:9-12.
  - As Mr. Song discusses, “the numbers [SDI] submitted were vastly different from the actual numbers. [SDI], in turn, did not expect that the competitors were providing us with the exact numbers.” 12 December 2012, Deposition of In Hwan Song, Volume 1, at 121:12-15.
  - The information Mr. Song did receive he used to “have [a] better understanding about the market and customers.” 14 December 2012, Deposition of In Hwan Song, Volume 3, at 285:6.
- Deposition of Jae In Lee: Mr. Lee states "…when I attended the meetings, I always prepared two data relating to the supply volume and prices in actual numbers and false information. Because I went there with false information, I believe other companies also would have come with false information. And I recall that other companies made numerous complaints to us." 24 July 2013, Deposition of Jae In Lee, Volume 1, at 45:17-24.
- Deposition of Jun Yeol Youn:
  - Mr. Youn states: "[he] had absolutely no reason to tell [competitors] the accurate information […] [he] always gave them the smaller number compared to the actual sales or actual production volume." 11 September 2013, Deposition of Jun Yeol Youn, Volume 1, at 40:20-23.
  - It was very typical of the competitors to cheat and challenge each other. Regarding a particular example reviewed by Mr. Youn, he notes: "here it says C.C. Liu, from Chunghwa, is challenging me that SDI is actually making 150,000 pieces. But I believe, actually, at this time SDI was making over 200,000 pieces. So I believe this document is a typical documentation of the situation where at a meeting people were challenging each other, accusing each other of cheating." 12 September 2013, Deposition of Jun Yeol Youn, Volume 2, at 270:11-18.
- Deposition of Deok-Yun Kim:
  - Mr. Kim states "when capacity information was exchanged at those meetings, accurate capacity information was not disclosed. I myself provided false information when provided -- when providing our capacity information." 27 March 2013, Deposition of Deok-Yun Kim, Volume 1, at 17:9-14.
  - Mr. Kim also states that many different factors can affect production capacity, such as whether the line is split between producing two different tube sizes, how many hours the lines is operational per day, and whether highly-priced models or simple models are produced. 27 March 2013, Deposition of Deok-Yun Kim, Volume 1, at 17:16-18:11.
  - He states, "…even the numbers for future production [...] would tend to change all the time depending on market circumstances." 27 March 2013, Deposition of Deok-Yun Kim, Volume 1, at 23:8-11.
  - Mr. Kim “hardly trusted” production numbers he gathered from the meetings. 27 March 2013, Deposition of Deok-Yun Kim, Volume 1, at 22:15-16.
  - Mr. Kim states that giving false information would "give [SDI] an advantage in doing our business and would probably give a disadvantage to Chunghwa." 28 March 2013, Deposition of Deok-Yun Kim, Volume 2, at 267:22-24.
  - Mr. Kim states that "information about the capacity of one CRT line, in the case of producing just very generic simple products, was not regarded as so sensitive at that time." 27 March 2013, Deposition of Deok-Yun Kim, Volume 1, at 19:15-18.
  - He mentions "regarding the production figures from one CDT line, I think competitors probably could have been able to estimate the rough numbers." 28 March 2013, Deposition of Deok-Yun Kim, Volume 2, at 267:9-12.
  - In regards to alleged audit agreements between the manufacturers, Mr. Kim states “there were instances where such an agreement was discussed once or twice but [he] thought that it was a very unrealistic idea and because of the company's [SDI’s] policy, which prevented showing the inside of the plant to a competitor…" He continues to say "[a]t that time while other competitors came probably once or twice, only a part of the plant was shown to them and, at that time during their visits, lines would be stopped and as soon as they left those lines were restarted..." Similarly, when SDI technicians or engineers visited competitors’ facilities, they were shown "a very limited part of their plant..." Additionally, Mr. Kim states

103. In fact, this evidence goes beyond episodic cheating and suggests that some firms such as SDI had an active policy of seeking to gain competitive advantage by preparing false information about its capacity, production and prices and using it to mislead its competitors. This is evident both in deposition testimony from SDI executives and from contemporaneous documents. It also appears that SDI felt that its competitors had similar objectives and followed similar practices in the meetings. Dr. Netz recognized in her deposition that this type of conduct would reduce the effectiveness of a cartel.[147]

104. Examples from deposition testimony include the following:

- Deposition of Jun Yeol Youn: Mr. Youn states that he lied to other suppliers at the glass meetings because "the meeting[s] themselves [were] a place where people came to obtain information about the

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"when our people went there the lines were not operating but they [SDI's personnel] told me [Mr. Kim] that when they touched the facilities they could see that the lines had just stopped operating." Thus, he believed that "those visits had no effect at all." 27 March 2013, Deposition of Deok-Yun Kim, Volume 1, at 77-78.

- "In order not to provoke Chunghwa, other companies submitted 200K~300K less than actual… Especially, the 17" CDT production/sales were adjusted by 150K to 200K." SDCRT-0086675 - SDCRT-0086681, at 6680E.
- Other examples include SDCRT-0090350 - SDCRT-0090353, at 0351E; CHU00031075 - CHU00031087; 20 June 2013, Deposition of Hoon Choi, Volume 2, at 209, 211-233; 11 September 2013, Deposition of Jun Yeol Youn, Volume 1, at 39:11-25; 12 September 2013, Deposition of Jun Yeol Youn, Volume 2, at 284:5-16; 27 March 2013, Deposition of Deok-Yun Kim, Volume 1, at 31:11-18, 35:1-36:21; and 28 March 2013, Deposition of Deok-Yun Kim, Volume 2, at 324:7-325:24 and 331:2-16.

[146] See, e.g.,

- Regarding SDD, "Mr. Moon [Orion] claimed that he believe that SDD had strong ambitions to expand M/S, and that its major strategy is to 'kill the competing makers'. So he was suspicious about SDD's attitude toward holding prices." CHU00028952 - CHU00028954, at 8954E.
- "The Korean makers not only took away orders from the Japanese makers, but also drove the Taiwanese makers to the wall!" CHU00030888 - CHU00030893, at 0888.01E.
- Hoon Choi notes several contentious issues regarding "content and atmosphere" for a meeting in Taiwan between LPD, CPT, and SDI, on May 6, 2004. SDCRT-0090299 - SDCRT-0090301, at 0299.01E. Particularly, regarding sales volume, Choi notes that "hiding […] sales of 7K […] continuing to challenge whether the figures are true." SDCRT-0090299 - SDCRT-0090301, at 0300.01E.
- "In order not to provoke Chunghwa, other companies submitted 200K~300K less than actual… Especially, the 17" CDT production/sales were adjusted by 150K to 200K." SDCRT-0086675 - SDCRT-0086681, at 6680E.
- "There were numerous discussions and people talked about it a lot. But for that discussion to lead to actual implementation, there were many different factors that made it difficult. Each company had a different situation, and customer demands were very different, too. So I believe that it was -- yes, the discussions did exist, but they were never implemented." Deposition of Samsung SDI 30(b)(6) Jaein Lee, Volume 2, 7 June 2012, at 286:2-10.
- "President Ha of SDD uses its large remaining production capacity to necessitate competition with CPT, giving the three major CPT customers offer that is more preferential than that of CPT. CPT told them: Taiwan makers are CPT's only territory, the bottom line being more sensitive. If SDD insists on competing with the belief of 'full production capacity, no profit', CPT will use even more pressure of production capacity to not only bravely combat for Taiwan makers, but also go to Korea and with even more unreasonable means, make it impossible for SDD to establish foothold. President Ha of SDD will convey this to Korea headquarters!" CHU00028773 - CHU00028774, at 8774.01E-.02E.
- Other examples include 12 September 2013, Deposition of Jun Yeol Youn, Volume 2, at 269:25-270:18; 27 March 2013, Deposition of Deok-Yun Kim, Volume 1, at 77:1-18; CHU00005963; CHU00028763 - CHU00028767, at 8764E; CHU00028589 - CHU00028590, at 8590.01E and 8590.02E; CHU00028952 - CHU000289524; CHU00030695 - CHU00030697; CHU00030888 - CHU00030893, at 0888.01E; CHU00031249 - CHU00031250; SDCRT-0090299 - SDCRT-0090301; SDCRT-0086537 - SDCRT-0086539; SDCRT-0090267 - SDCRT-0090274; SDCRT-0090306 - SDCRT-0090311, at 0310E; SDCRT-0090350 - SDCRT-0090353, at 0351E; SDCRT-0088852 - SDCRT-0088856; SDCRT-0091919 - SDCRT-0091920; and SDCRT-0104660 - SDCRT-01046601.

[147] Netz Deposition, at 166:7-169:13. See also Elzinga Deposition, at 219:3-234:13.

other side and to increase their own sales volumes. So there was no reason to be honest or truthful or sincere".[148] Deposition of Hun Sul Chu: Mr. Chu states, "So what that means is that even if we discussed the prices, we did not trust the competitor's prices. [...]And we actually – the prices we actually provided to the customer were different prices. There were two purposes for this. First of all, we had to expand our company's market share. Second, we had to kill the competitors no matter who they were. So we stuck to those two principals. So in the end, LPD died out. All our CRT competitors have fallen before us. So what we did was try to eliminate all our competitors and become the last winner to survive in the end."[149]

- Deposition of In Hwan Song: Regarding the reliability of the figures shared during the meetings, Mr. Song states, "what I did was to provide the information which was different from the actual data. Therefore, I actually did not put much trust in the information I received from those meetings."[150] As Mr. Song discusses, "the numbers [SDI] submitted were vastly different from the actual numbers. [SDI], in turn, did not expect that the competitors were providing us with the exact numbers."[151] The information Mr. Song did receive he used to "have [a] better understanding about the market and customers."[152]

- Deposition of Jae In Lee: Mr. Lee states "[W]hen I attended the meetings, I always prepared two [sets of] data relating to the supply volume and prices in actual numbers and false information. Because I went there with false information, I believe other companies also would have come with false information. And I recall that other companies made numerous complaints to us."[153]

- Deposition of Jun Yeol Youn: Mr. Youn states "[he] had absolutely no reason to tell [competitors] accurate information […] [he] always gave them the smaller number compared to the actual sales or actual production volume."[154] Regarding a particular example reviewed by Mr. Youn, he notes "here it says C.C. Liu, from Chunghwa, is challenging me that SDI is actually making 150,000 pieces. But I believe, actually, at this time SDI was making over 200,000 pieces. So I believe this document is a typical documentation of the situation where at a meeting people were challenging each other, accusing each other of cheating."[155]

- Deposition of Deok-Yun Kim: Mr. Kim states "when capacity information was exchanged at those meetings, accurate capacity information was not disclosed. I myself provided false information when provided – when providing our capacity information."[156] Mr. Kim also states that many different factors can affect production capacity, such as whether the line is split between producing two different tube sizes, how many hours the lines is operational per day, and whether highly-priced models or simple models are produced.[157]

[148] 11 September 2013, Deposition of Jun Yeol Youn, Volume 1, at 41:8-12.
[149] 12 February 2014, Deposition of Hun Sul Chu, Volume 2, at 283:22-284:11
[150] 14 December 2012, Deposition of In Hwan Song, Volume 3, at 284:9-12.
[151] 12 December 2012, Deposition of In Hwan Song, Volume 1, at 121:12-15.
[152] 14 December 2012, Deposition of In Hwan Song, Volume 3, at 285:6.
[153] 24 July 2013, Deposition of Jae In Lee, Volume 1, at 45:17-24.
[154] 11 September 2013, Deposition of Jun Yeol Youn, Volume 1, at 40:20-23.
[155] 12 September 2013, Deposition of Jun Yeol Youn, Volume 1, at 270:11-18.
[156] 27 March 2013, Deposition of Deok-Yun Kim, Volume 1, at 17:9-14.
[157] 27 March 2013, Deposition of Deok-Yun Kim, Volume 1, at 17:16-18:11.

- Deposition of In Hwan Song: As Mr. Song discusses, "the numbers [SDI] submitted were vastly different from the actual numbers. [SDI], in turn, did not expect that the competitors were providing us with the exact numbers."[158] The information Mr. Song did receive he used to "have [a] better understanding about the market and customers."[159]

- Deposition of Hoon Choi: Mr. Choi states that he had "given false information or wrong information because [he] hoped that competitors would believe it."[160] Mr. Choi states "I met with competitors in order to obtain market information. However, no one actually gave the correct information; everyone gave the false information […] I thought that if I can give them false information in order to lead them to make wrong decisions, it will be helpful for our company."[161]

- Deposition of Jae In Lee: "What I was thinking about competitors, unlike what is written here, I considered them as not a companion but someone that we need to beat, we need to overcome and we need to win. So, ultimately, in order to beat them in the CDT market and increase our market share, I believe I was asking internal cooperation in order to come up with a strategy to beat other CDT makers by giving them false information."[162]

105. Examples from contemporaneous documents include the following:

- SDCRT-0090346 reports on an alleged agreement in 2004 among SDI, LPD and Chunghwa to reduce capacity by 20% among the three companies. SDI submitted a plan to reduce its capacity by two lines which would total 5.7 million unit of production. However the document shows that SDI's actual plan was to only reduce capacity by one line resulting in a reduction of 1.8 million units rather than the 5.7 million submitted to the group.[163]

- Regarding a particular example reviewed by Jae In Lee, he states "in 2001 actual sales of our company was 24,300,000. However, the number we gave to other companies in glass meetings was 22 million. So we cheated them by 2.3 million, and that was the number that was submitted and discussed at the meetings." Further, he states that this sort of deception "wasn't only done for the sales, it was also done for the prices." SDI prepared two prices in order to provide false information to other companies.[164]

- See also: SDCRT-0088852 – SDCRT-0088856, at 8853E; SDCRT-0090267 – SDCRT-0090274, at 0268E; and SDCRT-0090306–SDCRT-0090311, at 0307E.

106. Several of the examples provided above also indicate that SDI executives believed that its competitors often followed similar practices and objectives. Additional examples include the following:

[158] 12 December 2012, Deposition of In Hwan Song, Volume 1, at 121:12-15.
[159] 14 December 2012, Deposition of In Hwan Song, Volume 3, at 285:6.
[160] 20 June 2013, Deposition of Hoon Choi, Volume 2, at 209:21-23.
[161] 20 June 2013, Deposition of Hoon Choi, Volume 2, at 212:3-7, 235:4-6.
[162] 25 July 2013, Deposition of Jae In Lee, Volume 2, at 283:23-284:5.
[163] SDCRT-0090346 - SDCRT-0090349, at 0347E.
[164] 25 July 2013, Deposition of Jae In Lee, Volume 1, at 282:4-13.

- Deposition of In Hwan Song: As Mr. Song discusses, "the numbers [SDI] submitted were vastly different from the actual numbers. [SDI], in turn, did not expect that the competitors were providing us with the exact numbers."[165]

- Deposition of Deok-Yun Kim: At the manufacturer meetings, Mr. Kim mentions that the future prices submitted by SDI were not accurate, and he also thought "that the prices that were submitted by competitors would not be accurate."[166] Mr. Kim suspects that they received false information in return: "there were instances where I knew and there were other instances […] where I did not know."[167] He continues to say, "when it came to price or production figures, I believe that there was little trust among all of the participants."[168]

- Deposition of Hoon Choi: Regarding the passing of information Mr. Choi states "I kept giving them [the] wrong information, and I think they also gave me the wrong information, and continuously the three companies talked lies to each other."[169]

E. Other evidence cited by Dr. Netz

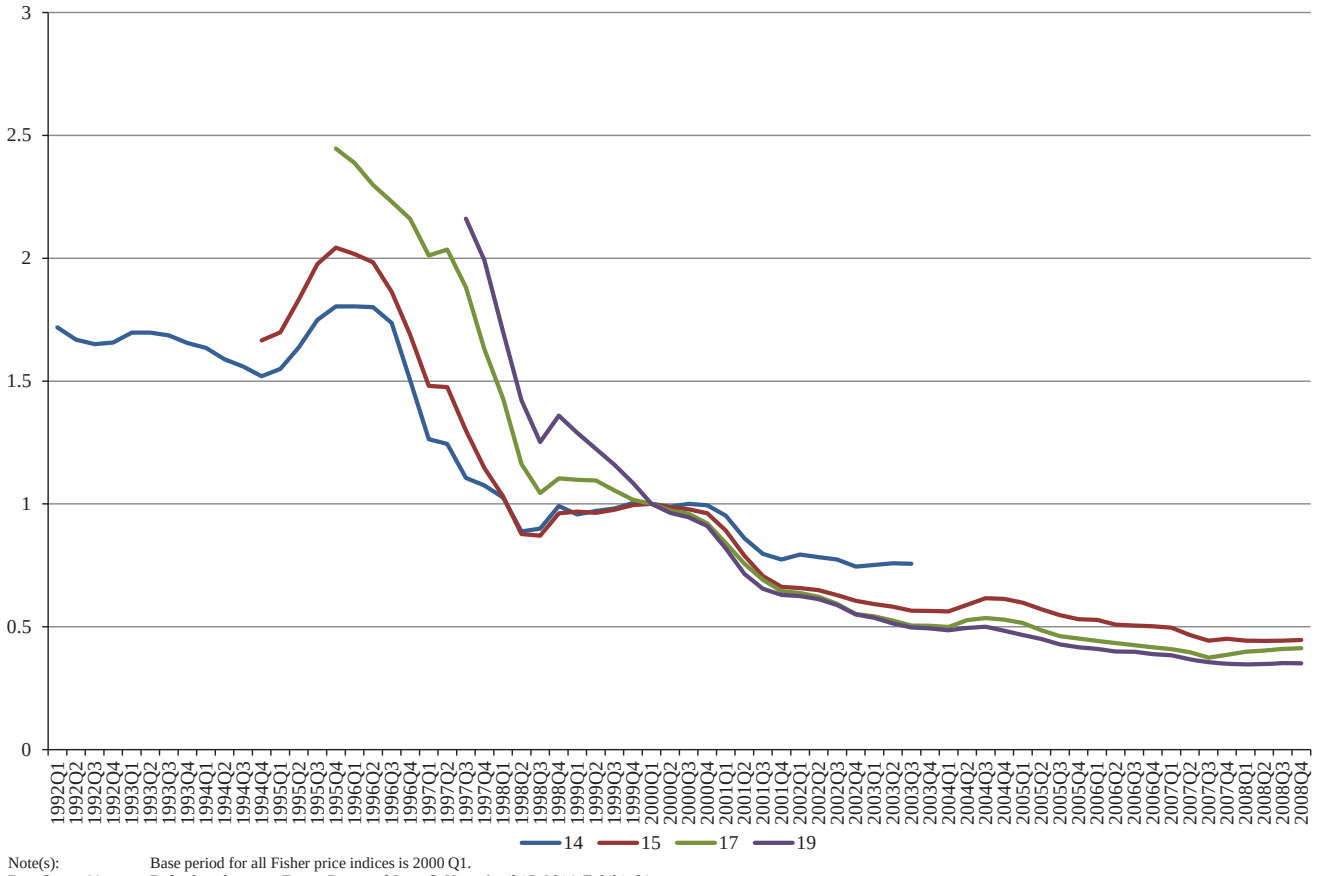
107. Dr. Netz argues that: "The cartel's success is demonstrated by the statements and conduct of cartel members. … In contemporaneous business documents, including notes from cartel meetings, cartel members repeatedly declared their ability and intent to raise and maintain the prices of CPTs and CDTs above the competitive level. Cartel members also regularly reported their success in raising or maintaining prices for CPTs and CDTs."[170] However, the documents cited by Dr. Netz that allegedly refer to cartel success do not prove the effectiveness of the alleged cartel or the existence of substantial overcharges. These claims of cartel "success" must be viewed in the larger context of declining prices throughout the alleged conspiracy period and the relatively modest overcharges derived from the econometric analysis in Section IV below. This comprehensive empirical evidence undercuts Dr. Netz's anecdotal examples of cartel "success."

108. In addition, many of Dr. Netz's examples of "cartel success" come from late 1998 and 1999 when the extremely rapid decline in CDT prices that occurred during late-1996 to mid-1998 slowed to some extent. However, Dr. Netz fails to mention that these "successes" followed an extended period of rapidly plummeting CDT prices. As shown in Figure 30, CDT prices fell virtually continually from mid-1996 to mid- 1998 before experiencing the flattening or in some cases very small increases described by Dr. Netz. Clearly, the alleged conspiracy was not "successful" at preventing the collapse in price over this earlier time period.[171]

[165] 12 December 2012, Deposition of In Hwan Song, Volume 1, at 121:12-15.
[166] 27 March 2013, Deposition of Deok-Yun Kim, Volume 1, at 31:17-18.
[167] 28 March 2013, Deposition of Deok-Yun Kim, Volume 2, at 324:23-25.
[168] 29 March 2013, Deposition of Deok-Yun Kim, Volume 2, at 325:9-12.
[169] 20 June 2013, Deposition of Hoon Choi, Volume 2, at 234:15-18.
[170] Netz Expert Report, at 27.

Figure 30

CDT Price Indices by Size



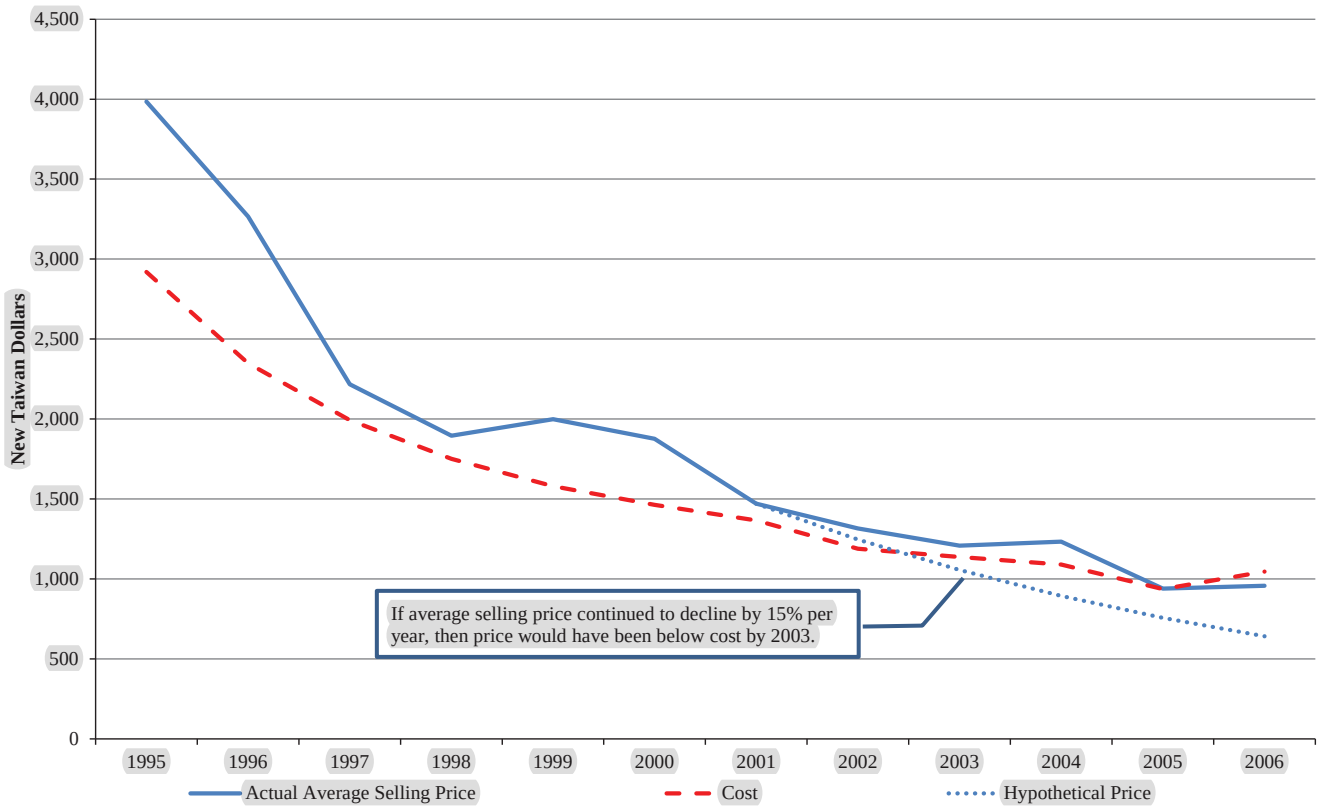
Note(s): Base period for all Fisher price indices is 2000 Q1.
Data Source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibit 64.
Source File(s): combine_target_defendant.dta; fisher_app_size_q.xlsx; p053_netz_fishers_by_size.do; a053_netz_fishers_by_size.xlsx

109. Dr. Netz also uses the slowdown in the rate of CDT price decline over time to argue that "CRT prices exhibited remarkable resiliency in the face of LCD encroachment, indicating that the cartel successfully avoided cutthroat competition by collusively maintaining cartel prices and that the prices of CRTs were not constrained by prices of LCD finished goods." However, as shown in Figure 31 below, Dr. Netz ignores the fact that CDT prices and margins had already fallen substantially by the time that LCDs began to make substantial penetration of computer monitors. For example, Dr. Netz's implicit assumption on p. 36 of her report that CDT prices would have continued to decline at 18% per year absent the alleged conspiracy from the already low levels that prevailed in 2001 implies that Chunghwa CDT prices would have declined well below its reported direct costs during the years after 2001.[172]

[172] Figure 31 uses a 15% rate of decline based in the Chunghwa price data shown in the figure rather than Dr. Netz's 18%.

Figure 31

Chunghwa 15" CDT Average Selling Price and Cost



Note(s): 1995-2001 actual average selling price CAGR of -15% used to derive 2002-2006 hypothetical price.
14V CDTs are 15" CDTs, according to 15IN/14V 28MM 1024X768 75HZ 563N CRT VGA VESA WHITE Specifications, available at http://www.cnet.com/products/15in-14v-28mm-1024x768-75hz-563n-crt-vga-vesa-white/specs/, CNET, accessed July 16, 2014.

Data Source(s): CHWA00256934 - CHWA00256937.

Source File(s): CHWA00256934 - HIGHLY CONFIDENTIAL.xls; a050_profit_margins.xlsx

IV. DR. NETZ'S CDT OVERCHARGE REGRESSION MODEL DOES NOT PROVIDE RELIABLE EVIDENCE OF SUBSTANTIAL COLLUSIVE OVERCHARGES.

A. Dr. Netz's own analysis of CDT overcharges undermines her claim that the alleged cartel had class-wide impact.

110. In order to estimate CDT overcharges, Dr. Netz estimates a regression model that effectively compares CDT prices during the alleged conspiracy period to prices during two benchmark or unaffected periods after controlling for differences in a number of other factors during these periods. Specifically, she divides the alleged cartel period into two sub periods (Q2 1995 through 2006 and, separately, 2007). The benchmark period is comprised of: (i) the pre-cartel period of the two years prior to the alleged cartel (i.e., Q1 1993 through Q1 1995), and (ii) a one year post-cartel period from Q1 2008 to Q4 2008. In effect, Dr. Netz compares the average CDT price during each cartel period with the average price during the combined pre and post benchmark period after controlling for a limited set of market factors such as macroeconomic factors, LCD penetration, CDT size and manufacturer. Based on this regression analysis, Dr. Netz concludes that "but-for" CDT prices absent the alleged

conspiracy would have been roughly 22 percent lower than actual prices during Q2 1995 through 2006, and they would have been 11.4 percent lower in 2007.

111. In Sections IV.B and C below, I describe Dr. Netz's econometric model of CDT overcharges in somewhat more detail, and explain a number of economic and statistical problems with her analysis. However, before moving to those problems, I note that Dr. Netz's own econometric model of CDT overcharges is inconsistent with Plaintiffs' claims that the alleged conspiracy impacted all members of the proposed indirect purchaser class. In estimating her overcharge model, Dr. Netz calculates a single combined overcharge estimate for all years between 1995 and 2006 pooled together, with the single year 2007 estimated separately. Specifically, Dr. Netz uses this model to conclude that the effect of the alleged conspiracy on CDT prices was a 22 percent overcharge for the entire twelve year period from the second quarter of 1995 until the fourth quarter of 2006.[173]

112. However, making no changes to her analysis other than just allowing the overcharge to vary over the conspiracy period in a way that better reflects actual movements in CDT prices over the period, the result is very striking:[174]

- The estimated overall overcharge declines substantially.
- A large portion of the remaining "overcharge" occurs in years 1995 and 1996.
- The overcharge for 1997-2007 is small and generally not statistically significant.
- The ability of the model to explain changes in CDT prices over time improves.

113. Allowing the effect of the alleged conspiracy to vary over the class period in the Netz model can be implemented in a number of different ways. One approach is to include additional dummy variables for the years 1995 and 1996 to the Netz model. This approach is economically reasonable because of the unique demand increases and capacity constraints that led to the price increases in 1995 that persisted into 1996. Another approach is to include annual dummy variables for each year of the alleged conspiracy, to assess overcharges in each year separately. The dramatic reductions in Dr. Netz's estimated overcharges described above occur with either approach.

114. For example , if we only add additional indicator variables to Dr. Netz's model for 1995 and 1996 and make no other changes to the model, the overcharge for 1997-2006 declines from Dr. Netz's reported figure of 22 percent shown in column (1) of Table 6 to a negative and statistically insignificant level of -14.4 percent shown in column (2). This result implies zero overcharges for any class member that purchased CDTs during this 1997-2006 period. Similarly, if we replace the Netz conspiracy variable with annual indicator variables for each year, the annual indicators are negative for all but three of the 11 years from 1997 to 2007. Moreover, none of the three

[173] Dr. Netz explained her approach in her deposition as follows: "My expert testimony is that an economically reasonable estimate of the overcharge for CPTs or for CDTs from '95 to 2006 was the same percentage" Netz Deposition, at 111:8-9. "The best we can do is come up with an informed estimate, and my informed estimate is that for any day between 1995 and 2006, purchasers of monitor, of the CRT monitor, paid an overcharge of 25 percent relative to what they would have paid had the defendants followed the law." Netz Deposition, at 113:25-114:5. The 22 percent figure was reported in Dr. Netz's errata subsequent to her deposition. Netz, Janet S., Ph.D., 03 July 2014, Errata to the Expert Report of Janet S. Netz, Ph.D., In re: Cathode Ray Tube (CRT) Antitrust Litigation, at 1.

[174] This approach is consistent with the regression model that Dr. Netz used in the LCD litigation where she estimated a model with annual dummy variables for the conspiracy period. See Netz, Janet S., Ph.D., 25 May 2011, Expert Report of Janet S. Netz, Ph.D., In re: TFT-LCD (Flat Panel) Antitrust Litigation, at 93.

years with positive overcharges are statistically significant. See Table 6. Thus, accepting Dr. Netz's econometric model and making this one modification that improves the performance of the model implies that most IPP class members who purchased computer monitors after 1997 were not adversely impacted by the alleged conspiracy.[175]

[175] "In class action cases where class membership varies over time, estimating an overcharge for various subperiods may lead to a more accurate estimate of overcharges for specific class members than would an estimate of the average overcharge over the relevant time period." ABA Section of Antitrust Law, "Proving Antitrust Damages: Legal and Economic Issues," (2D ED. 2010), at 204 footnote 23.

Table 6[176]

Effect of Allowing Estimated Overcharge To Vary Over Time in the Netz Model

Y = Log of average quarterly CDT price by size-manufacturer	(1) Netz Model	(2) Netz + 1995/96 Dummies	(3) Netz + Annual Dummies
Cartel Dummy{=1 for 1995-2006}	0.220***		
	(0.000)		
Cartel Dummy{=1 for 1995}		0.161***	0.244***
		(0.000)	(0.000)
Cartel Dummy{=1 for 1996}		0.174***	0.271***
		(0.000)	(0.000)
Cartel Dummy{=1 for 1997-2006}		-0.144	
		(0.125)	
Cartel Dummy{=1 for 1997}			0.022
			(0.820)
Cartel Dummy{=1 for 1998}			-0.136
			(0.191)
Cartel Dummy{=1 for 1999}			-0.004
			(0.969)
Cartel Dummy{=1 for 2000}			-0.065
			(0.475)
Cartel Dummy{=1 for 2001}			-0.150
			(0.114)
Cartel Dummy{=1 for 2002}			-0.164*
			(0.086)
Cartel Dummy{=1 for 2003}			-0.038
			(0.674)
Cartel Dummy{=1 for 2004}			0.017
			(0.862)
Cartel Dummy{=1 for 2005}			0.003
			(0.975)
Cartel Dummy{=1 for 2006}			-0.071
			(0.450)
Cartel Dummy{=1 for 2007}	0.114**	-0.139	-0.048
	(0.022)	(0.134)	(0.487)
Fixed Effects	Quarter Manufacturer-size	Quarter Manufacturer-size	Quarter Manufacturer-size
Observations	1,114	1,114	1,114
R-squared	0.954	0.962	0.972

p-values in parentheses

*** p<0.01, ** p<0.05, * p<0.1

115. As discussed further below, while year-to-year changes in overcharge estimates do not themselves indicate that Dr. Netz's model is unreliable, the fact that the overcharge estimates from the Netz model change so dramatically as a result of small changes in the model shows that the Netz model is unreliable and not at all robust. When small changes in explanatory variables and/or model specification lead to such substantial changes

[176] See my backup file "Effect of Allowing Estimated Overcharge to Vary Over Time.xlsx."

in the estimated conspiracy effect, the proposed model cannot be relied upon to provide a reliable basis for damages.[177]

B. Dr. Netz's overcharge estimates rely heavily on price increases in 1995 which are not plausibly related to the alleged conspiracy.

116. It is highly unlikely that the large estimated "overcharges" in 1995 and 1996 that are produced by the Netz model are due to the alleged conspiracy for (at least) two reasons: 1) Dr. Netz's own claimed evidence of alleged collusive activity indicates that such activity was very limited in the early years of the alleged conspiracy, rather than higher as the Netz model implies; and 2) there are more plausible alternative explanations for the relatively high prices in 1995 and 1996 that have nothing to do with the alleged conspiracy. Regarding the first point, as discussed in Section III.A above, the two years in which the Netz model overcharges were the highest, 1995 and 1996, are years in which Dr. Netz's own data indicates that the estimated target price coverage was very low both absolutely and compared to later years.[178] In fact, Dr. Netz's target price database reports a coverage percentage of 0% for every quarter in 1995. Accordingly, the evidence that the price increases in 1995 and the large estimated "overcharges" in 1995 and 1996 were caused by collusive activity with respect to target prices is very weak.

117. Similarly, there also is no evidence that the price increases in 1995 and the large estimated "overcharges" in 1995 and 1996 could be due to collusive output restrictions. Dr. Netz's Exhibit 28 lists documents that she characterizes as instances in which Defendants agreed to reduce production capacity and/or output. The earliest CDT-related instance (and the only instance in the 1995 or 1996) on this list is from a meeting that occurred in late November 1996, far too late to have any role in explaining price increases in 1995. Moreover, as discussed in Section III above, the defendants were adding capacity and increasing output rapidly throughout this early period. In short, the evidence that the high estimated "overcharges" in 1995 and 1996 are due to the alleged conspiracy is extremely weak.

118. In addition, by attributing all of the 1995 and 1996 effects to the alleged conspiracy, Dr. Netz's analysis ignores the fact that there were many other non-conspiracy related factors occurring during this period. As discussed in detail in Section III.A above, 1995 was characterized by unexpectedly rapid growth in the demand for computer monitors, shifts in demand toward larger monitors, and monitors with higher resolution, tight CDT

[177] See, e.g.,

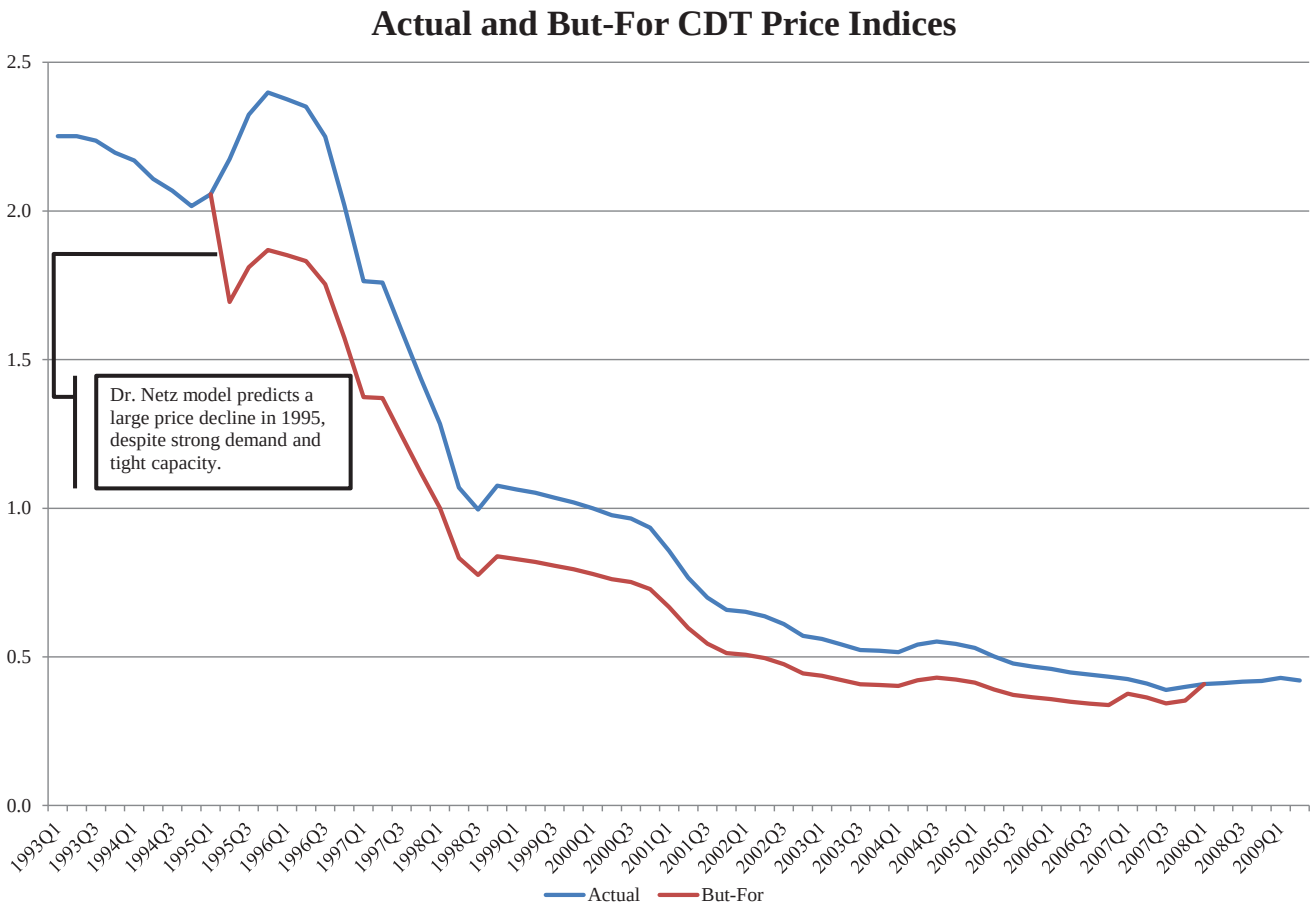
- "Sensitivity analysis consists of purposely running a number of alternative specifications to determine whether particular results are robust (not statistical flukes). In essence, we're trying to determine how sensitive a potential 'best' equation is to a change in specification because the true specification is not known. Researchers who use sensitivity analysis run (and report on) a number of different reasonable specifications and tend to discount a result that appears significant in some specifications and insignificant in others. Indeed, the whole purpose of sensitivity analysis is to gain confidence that a particular result is significant in a variety of alternative specifications, functional forms, variable definitions, and/or subsets of the data." Studenmund, A. H., Using Econometrics: A Practical Guide, 5th ed., 2006, at 179-180.
- "Suppose that the purpose of the study is to estimate the coefficients of some 'key' variables. The first step of this approach, after identifying a general family of models, is to undertake an 'extreme bounds analysis' in which the coefficients of the key variables are estimated using all combinations of included/excluded 'doubtful' variables. … This range of information will produce a range of estimates of the parameters of interest; a narrow range ('sturdy' estimates) implies that the data at hand yield useful information, but if this is not the case ('fragile' estimates), it must be concluded that inferences from these data are too fragile to be believed." Kennedy, Peter E., A Guide to Econometrics, 3rd ed., 1992, at 75-76.

[178] These calculations are detailed in my backup file "CDT Target Price Coverage by Quarter.xlsx."

capacity, glass shortages[179] and other factors. Because Dr. Netz's econometric model does not adequately control for these factors, she effectively attributes the effects of these non-collusive factors to the alleged conspiracy.

119. The implausibility of Dr. Netz's overcharge estimates also can be illustrated by showing the "but-for" CDT prices that are implied by such overcharges. For example, the red line in Figure 32 shows the pattern of "but-for" CDT prices implied by Dr. Netz's overcharge model. Dr. Netz's but for price exhibits a substantial drop at the beginning of the alleged conspiracy period in the second quarter of 1995. Such a substantial drop in prices during this period makes no economic sense. As discussed above, 1995 was a period of high demand, tight CDT capacity, CRT glass shortages and rising prices. The drop in CDT prices implied by the Netz model during this period further undermines Dr. Netz's overcharge estimates.

Figure 32



Data Source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibits 64-65.
Source File(s): all_defendants_dropexout_collapsed.dta; total production.xlsx; tukey filter.do; Sensitivity Table.xlsx; fisher app-quarter.do; fisher_app_q.xlsx; a001_fisher_app_quarter.xlsx

120. Dr. Netz's assumption that the 1995-96 price movements were caused by the alleged conspiracy also is inconsistent with the opinions of DAP Plaintiff Dell's expert Dr. Mohan Rao. Dr. Rao was the only one of the

[179] While Dr. Netz's model does include a glass price series in her model, the contemporaneous reports cited in Section III above indicate that the problems were not limited to glass price increases. Adequate glass for CDT production was not available during some portions of 1995.

Plaintiffs' experts to explicitly address the unique market conditions during this time period, and he concluded that it would be inappropriate to assume that the alleged conspiracy accounted for the behavior of CDT prices in 1995 and 1996. He states:

- "CDT prices experienced a very large fluctuation in the period from March 1995 through the end of 1996. It appears that capacity was tight during some of this time period. This period was before any significant adoption of LCD monitors. These factors present challenges to forming an appropriate model of pricing behavior prior to 1997." (Emphasis added, footnotes omitted)

121. While there is strong evidence that non-collusive factors were important in explaining the movements in CDT prices during 1995 and 1996, it is important to recognize that my conclusion that Dr. Netz greatly overstated any possible overcharge is not dependent upon this opinion. Even if I were to inappropriately attribute a large portion of the estimated effect from the 1995 and 1996 coefficients to the alleged conspiracy, the estimated damages would still be far less than the amount estimated by Dr. Netz. This occurs because when I eliminate Dr. Netz's artificial restriction and allow the data to determine how the overcharge should vary over time, the coefficients on the other variables in the model change as the model is able to do a better job of explaining the movements in CDT prices over time. Accordingly, allowing the overcharge to vary over time does more than just reallocate Dr. Netz's 22 percent overcharge across the different years of the alleged conspiracy. It also causes a dramatic reduction in the average overcharge as well. For example, using model (2) in Table 6 and incorrectly assuming (for sake of illustration) that 100 percent of the estimated "overcharge" in 1995 and 1996 was due to the alleged conspiracy, the weighted average overcharge for the 1995 through 2007 time period still declines from the 22 percent reported by Dr. Netz to only 4.29 percent.[180]

122. However, because the evidence indicates that the estimated effects for 1995 and 1996 likely were caused primarily by underlying economic conditions unrelated to the alleged conspiracy, I have not assumed that the estimated effects for these years should be treated as "overcharges." Rather, for purposes of estimating damages, I believe it is more economically appropriate to use the overcharge that the adjusted Netz model estimates for the years 1997-2006 as the estimate for 1995 and 1996 as well. I believe this approach is conservative since all of the evidence presented by Dr. Netz suggests relatively little alleged collusive activity during 1995 and 1996.[181]

C. Dr. Netz's model of CDT overcharges is fundamentally unreliable and does not support a claim of substantial overcharges.

123. As discussed in Sections II and III above, the CDT industry experienced many substantial changes during the 16 year 1993-2008 period covered by Dr. Netz's analysis including a dramatic shift from rapid growth to rapid decline, substantial changes in consumer demand for different sizes and types of CDTs, large changes in market shares and substantial exit, and significant changes in the geographic location of both CDT supply and demand. Dr. Netz's model does a poor job controlling for these types of industry changes.[182]

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[180] See my backup file "weighted_average_overcharge.csv."

[181] In particular, Dr. Netz did not identify any target prices in 1995 and few in 1996 until the fourth quarter. Similarly, Dr. Netz's Exhibit 28 lists documents that she characterizes as instances in which Defendants agreed to reduce production capacity and supply. However, the earliest CDT-related instance (and the only instance in the 1995 or 1996) on this list is from a meeting that occurred in late November 1996, far too late to have any role in explaining the price increases in 1995.

[182] In light of the dramatic changes in the CDT industry over this 16 year period, I find it noteworthy that Dr. Netz did not perform any analysis of the stability of her regression model over this long time period. I also find it noteworthy that Dr. Netz did no analysis of whether the estimated overcharges varied by size of CDT.

124. Dr. Netz's model fails adequately to take account of key determinants of CDT prices such as the demand for desktop computer monitors, CDT production costs (other than glass), and the level of CDT production capacity. Since the primary use of CDTs was for computer monitors, a key determinant of CDT demand was the demand for desktop computers. Dr. Netz uses only very rough proxies for demand such as the unemployment rate and the level of OECD GDP. To better reflect changes in demand over time, I augmented Dr. Netz's model by adding a variable to measure worldwide quarterly shipments of desktop computers.[183] This variable enters the model with the expected positive sign and is highly statistically significant.

125. Dr. Netz uses only a single cost variable in her model -- the price of CRT glass in Korea. To better control for changes in costs during the relevant time period, I have added additional cost controls to Dr. Netz's overcharge regression. These include the cost of shipping since CDTs and computer monitors tend to be heavy, bulky products that were often shipped substantial distances across countries, and an index of labor cost in Korea. I have also added a variable for the Korean Won-US dollar exchange rate (since exchange rate fluctuations affect the cost of producing and importing CDTs and monitors from Korea and other Asian countries to the U.S., and because Dr. Netz's glass cost variable reflects glass prices in Korea, whereas the CDT price data are all expressed in US dollars. Basic economic forces of supply and demand suggest that these supply-side variables would likely affect prices of CDTs. These variables all have the expected signs and all are statistically significant, except the Korean labor cost variable.

126. As described above, the balance between demand and capacity also was an important determinant of CDT prices that is not adequately controlled for in the Netz model.[184] In fact, Dr. Netz implicitly agrees that the balance between CDT demand and capacity was an important determinant of CDT prices when she emphasizes the role of excess capacity in causing declines in CDT prices.[185] However, she makes the critical error of assuming that substantial excess capacity existed throughout the alleged conspiracy period (even in 1995). By allowing the estimated "overcharge" to be different in 1995 and 1996, a time period that was influenced substantially by the tight capacity and price increases in 1995, than in other years when there was substantially more excess capacity, I believe that this estimation method allows the model to effectively incorporate the situation of tight CDT capacity in a more economically reasonable way than the approach used by Dr. Netz.

127. Dr. Netz's model also fails to adequately control for changes in CDT product mix over time, and hence it ignores composition effects and important changes in CDT products over time within each manufacturer / size

[183] This variable was also used for the same purpose by Dr. Mohan Rao, the expert economist in the instant matter for Dell, a direct action plaintiff. I extended the desktop shipments series back in time from 1995 to 1993 using the year over year growth rates for each quarter of the IDC quarterly series for PC shipments from TAEC-CRT-00018123. The extrapolation is provided in my backup file "a052_idc_desktop_pc_qty_1993Q1_2009Q1.xlsx."

[184] Examples from contemporaneous business documents on the importance of the balance between capacity and demand:

- "As per last year's expected capacity increases, the supply demand situation is further out of balance. This has resulted in significant price erosions in CMT in 1997 (minus 30% versus average of 1996). Further price erosion at about -10% is expected in 1998 and 1999 and will soften only after that year when supply/demand is in balance again." LPD-NL00018267 - LPD-NL00018336, at 8270.
- "CMT prices on average have eroded drastically during 1997 (-30%). This was more severe than expected due to massive overcapacity. We expect the average market price erosion over the total review period to be at 3-4% for the 14" and 15", 5% for 17" and up to 6% annually for the 19". LPD-NL00018267 - LPD-NL00018336, at 8276.

[185] Netz Expert Report, at 5, 19-20.

category such as the transition from curved CDTs to more expensive flat CDTs. For example, one SDI document indicated that SDI's sales of flat CDTs increased from zero percent in 1996 to 54.4 percent by 2003.[186]

128. Dr. Netz also made a calculation error that inflates CDT overcharges by double counting a portion of her estimated overcharges. Using her econometric model of CDT overcharges, Dr. Netz effectively estimates the CDT overcharge relative to the but-for price of CDTs. She then multiplied this estimate by actual CDT sales to get the CDT overcharge in dollars. However, by applying her overcharge estimate to actual dollar sales instead of but-for dollar sales, she over-estimated damages because actual dollar sales already include the overcharge that she claims. In effect, Dr. Netz had included an overcharge on the overcharge, thereby over-estimating damages. This is incorrect and inflates damages. After being informed of this error in her deposition, Dr. Netz subsequently corrected this error in an errata dated July 3, 2014.[187]

129. Dr. Netz also ignores the fact that the dataset she uses to estimate overcharges is missing sales data for many manufacturers and time periods. Dr. Netz claims that the alleged conspiracy was comprised of fourteen members.[188] However, as shown in Table 7 below, many of the firms that provided CDT sales data for some years and/or products are missing data for other years and/or products. For example, Dr. Netz has no data on SDI's CDT sales during 1993-1997 and 2008. Similarly, she has no data for Daewoo prior to 2002 and no data for Hitachi prior to 1997. Dr. Netz provides no discussion of this issue and no analysis to indicate that such substantial gaps in data coverage would not affect her results. In fact, the hedonic analysis discussed in Section III.B above indicates that the prices of different manufacturers sometimes moved very differently from one another during the alleged conspiracy. The existence of such considerable variation across manufacturers raises considerable doubt about Dr. Netz's implicit assumption that no analysis of the potential effects of missing data on her overcharge estimates is necessary.

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[186] SDCRT-0203634 - SDCRT-0203664, at 3651E. See also:

- Similarly, another document indicates that Hitachi was "concentrating on a line-up of higher value products such as short length tubes, flat faced products and larger format (19" and above) CRTs." HEDUS-CRT00169116 - HEDUS-CRT00169137, at 9116.
- Dr. Netz stated in her deposition that she wanted to control for certain other CDT characteristics such as shape, and would have investigated such characteristics if the data were available. Netz Deposition, at 73:8-17.

[187] "A. Mr. Kessler and I had a disagreement over how to do math, and in thinking about it, it occurred to me that we were perhaps not starting from the same point; that each of us was describing correct math, but that I had not correctly interpreted the 25-percent overcharge that was mentioned for CDTs for 1995 to 2006, and I would like to have the opportunity to check my records and make sure that the number was applied correctly, and if it wasn't, to correct that error and put it on the record." Netz Deposition, at 216:14-22.

[188] BMCC, Chunghwa, Daewoo/Orion, Hitachi, IRICO, LG Electronics, LPD, Panasonic Corporation, MTPD, Philips, SDI, Samtel, Thai CRT, and Toshiba Corp.; Daewoo/Orion, LPD, and Thai CRT no longer exist and three companies that Plaintiffs have named as Co-Conspirators and with whom Plaintiffs have entered into a tolling agreement (Thomson, Mitsubishi, and Videocon). Netz Expert Report, at 2.

Table 7
Availability of Price Data in Dr. Netz's CDT Direct Overcharge Model

Year	Chunghwa	Daewoo	Hitachi	LG	LPD	Mitsubishi	Panasonic Corp.	Philips	SDI	Toshiba
1993				X				X		
1994	X			X			X	X		X
1995	X			X			X	X		X
1996	X			X			X	X		X
1997	X		X	X			X	X		X
1998	X		X	X			X	X	X	X
1999	X		X		X		X	X	X	X
2000	X		X		X		X		X	X
2001	X		X		X				X	X
2002	X	X	X		X	X			X	X
2003	X	X			X	X			X	X
2004	X	X			X	X			X	
2005	X	X			X	X			X	
2006	X				X				X	
2007	X				X				X	
2008	X				X					
2009	X									
2010	X									
2011	X									

Data Source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibit 83.
Source File(s): estimation_size.dta; p055_availability_of_price_data.do; a055_availability_of_price_data.xlsx

D. Economically reasonable changes that significantly improve the performance of Dr. Netz's model result in substantially lower overcharges estimates.

130. To illustrate the magnitude of some of the major economic and statistical problems with Dr. Netz's model discussed above, I have provided an alternative estimate of overcharges which makes a number of economically reasonable adjustments to the Netz model. First, I have relaxed the arbitrary assumption of a constant overcharge over the entire 1995-2006 period by replacing Dr. Netz's single variable for 1995-2006 with three separate variables for 1995, 1996 and 1997-2006. However, because the evidence indicates that the estimated effects for 1995 and 1996 likely were caused by underlying economic conditions unrelated to the alleged conspiracy, I have assumed that the overcharge in 1995 and 1996 was the same percentage (1.6 percent) as the overcharge that the modified model estimates for the years 1997-2006. I believe this approach is conservative since all of the evidence presented by Dr. Netz suggests that there was far less collusive activity during 1995 and 1996 than there was in 1997-2006. I have also added additional economically reasonable control variables that substantially improve the performance of the model as discussed above. Lastly, I have corrected Dr. Netz's arithmetic error in applying the overcharge percentage to the estimated CDT revenue.

131. When I make economically appropriate corrections for these major flaws in Dr. Netz's model, the overall average overcharge percentage for 1995-2006 declines from Dr. Netz's reported figure of 22 percent to an

estimate of 1.6 percent. The improved model that incorporates all of these changes is shown in column (3) of Table 8.[189]

Table 8[190]

Summary of CDT Overcharge Models

Y = Log of average quarterly CDT price by size-manufacturer	(1) Netz Model	(2) Netz Model + 1995/96 Dummies	(3) Netz Model + 1995/96 Dummies + Addnl Controls
Cartel Dummy{=1 for 1995-2006}	0.220***		
	(0.000)		
Cartel Dummy{=1 for 1995}		0.161***	0.161***
		(0.000)	(0.000)
Cartel Dummy{=1 for 1996}		0.174***	0.235***
		(0.000)	(0.000)
Cartel Dummy{=1 for 1997-2006}		-0.144	0.016
		(0.125)	(0.801)
Cartel Dummy{=1 for 2007}	0.114**	-0.139	-0.027
	(0.022)	(0.134)	(0.611)
Observations	1,114	1,114	1,114
R-squared	0.954	0.962	0.971

p-values in parentheses

*** p<0.01, ** p<0.05, * p<0.1

E. CDT profit margins provide additional evidence against Plaintiffs' conspiracy theory and Dr. Netz's overcharge estimates.

132. I use data on margins of CDT manufacturers to assess further the plausibility of Plaintiffs' theory of effective conspiracy and Dr. Netz's estimated overcharges. I find that such CDT profit margins are consistent with non-collusive forces of supply and demand for CDTs. CDT manufacturer margins did not exhibit sharp increases during the alleged cartel period relative to the pre-cartel period. As shown in Table 9, the only firm with gross margin data that extends prior to 1995 is Chunghwa. While Chunghwa's gross margins did increase somewhat in 1995, the evidence indicates that this likely was due to non-cartel factors such as high demand for computers and CDTs and capacity shortages. See Sections III.A and IV.B above It also is consistent with the generally increasing trend in Chunghwa's margins in prior years. However, rather than increasing further during the alleged conspiracy period, Chunghwa's margins declined sharply in 1997 and 1998, reflecting the substantial price competition during this period and the inability of the alleged conspiracy to arrest price declines despite a substantial increase in the frequency of target prices during these years as discussed above.[191]

[189] The 1.6 percent overcharge is lower than the 4.29 percent overcharge discussed above because the 4.29 percent inappropriately assumed for sake of illustration that 100 percent of the estimated 1995 and 1996 effect was due to the alleged conspiracy and because the 4.29 percent was based on a regression that does not include the additional control variables I added to Dr. Netz's model.

[190] See my backup file "Summary of CDT Overcharge Models.xlsx." A more detailed table of the regression output can be found in Appendix H.

[191] The same basic pattern is evident in the operating margins of Chunghwa and for SDI which reports a pre-tax margin. See Table 10. Plaintiffs might argue that the fact that Chunghwa's CDT margins declined to very low levels after 2007 implies

133. In addition, the margin data provides further economic evidence that Dr. Netz's estimated overcharges are implausible. Figures 33 and 34 and Tables 9 and 10 provide estimates of actual margins as well as what gross margins and operating margins would have been in the "but for" world if one were to accept Dr. Netz's estimates of overcharges. As shown in Figure 33, the implied but-for gross margin on CDT sales for Chunghwa is actually negative for 8 of the 12 years from 1995 through 2006 (and close to zero for two additional years). In other words, Dr. Netz's overcharge estimates imply that in the but- for world Chunghwa would not have been able to cover even its direct cost of goods sold during these years (not to mention its other costs such as overhead and the cost of capital). Similarly, Table 9 shows that Toshiba Corp.'s but-for gross margins for CDTs also would have been negative ranging from -14.1 percent in 1996 to a very large -27.1 percent in 1998. Once again, the Netz overcharges implausibly imply that Toshiba Corp. would have not even come close to covering its direct costs. Available gross margin data for one other firm, LPD, shows that the but-for gross margins also would have been very substantially lower than their actual gross margins. See Table 9.

134. Similarly, Table 10 provides estimates of actual operating margins as well as operating margins in a world but-for Dr. Netz's claimed overcharges. Operating margins differ from gross margins in that they subtract out additional costs such as corporate overhead and other costs that cannot be readily allocated to particular product lines. As shown in Figure 34, the but for operating margins for Chunghwa are negative for all years except 1995 and 1996, years when margins likely were relatively high due to high demand, capacity shortages and other reasons unrelated to the alleged conspiracy. The but-for operating losses for Chunghwa using Dr. Netz's overcharges exceed 20 percent of revenue for five of the years during the alleged cartel period, and the simple average of Chunghwa's but-for annual operating margins over the 1995-2006 period is -12.8 percent.[192] Accordingly, Dr. Netz's overcharge estimates imply that Chunghwa would have continued to incur large losses on its CRT business for many years.

135. While we have less complete data for firms other than Chunghwa, the data we do have also indicates that the Netz overcharge figures are unrealistic. For LPD, the implied but-for operating margins for CDT sales are substantially negative for all years for which data is available. See Table 10. But-for margins also would have been negative for SDI, based on "profit before tax" figures reported in a produced document,[193] despite the fact that SDI had very strong performance relative to its peers, with very large market shares gains throughout the relevant period and was perceived to be the most profitable firm in the industry.[194]

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that CDT prices were elevated by collusive overcharges in prior years. However, such an inference would not be valid. The low levels of CDT margins after 2007 reflect the continued declines in CDT demand due to continued LCD substitution as well as the effects of the financial crisis and global recession. The severity of the financial crisis and recession is illustrated by the fact that Chunghwa's LCD gross margins also experienced a very large decline during the same period. For example, Chunghwa's LCD gross margin declined from 18% in 2007 to -35% in 2009. See my backup file "a056_chunghwa_lcd.xlsx."

[192] These calculations are detailed in my backup file "a050_profit_margins.xlsx." While we have information on Chunghwa's gross margins for CRTs, Chunghwa did not report an operating margin for CRT sales. I estimated the CRT operating margin by assuming that any unallocated operating expenses (e.g. corporate overhead) would be the same percentage of revenue for CRT sales as for Chunghwa's other sales.

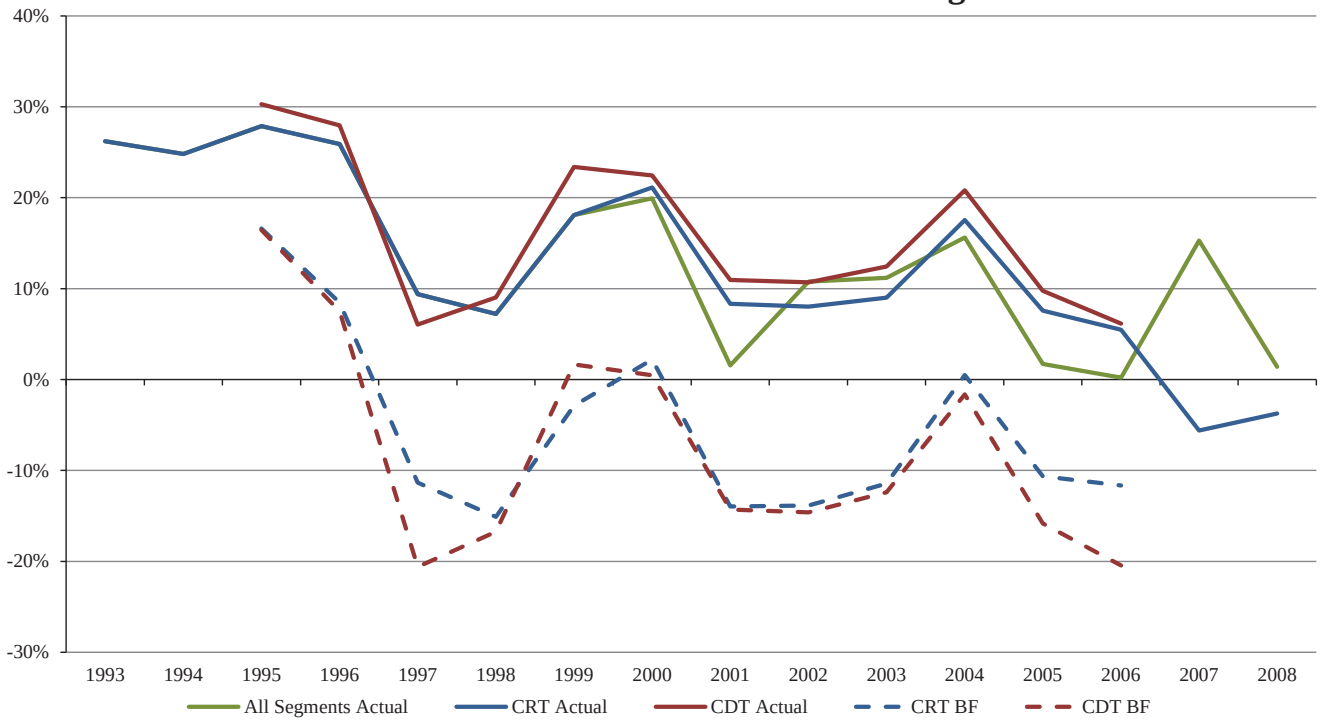
[193] SDCRT-0203634 – SDCRT-0203664, at 3652E-3653E. See my backup file "a050_profit_margins.xlsx."

[194] See, e.g.

- LPD-NL00173522- LPD-NL00173655, at 3584-3589.
- SDCRT-0203634 - SDCRT-0203664, at 3649E.

Figure 33

Actual & But-For Chunghwa Gross Margins Based on Dr. Netz's Estimated Overcharges



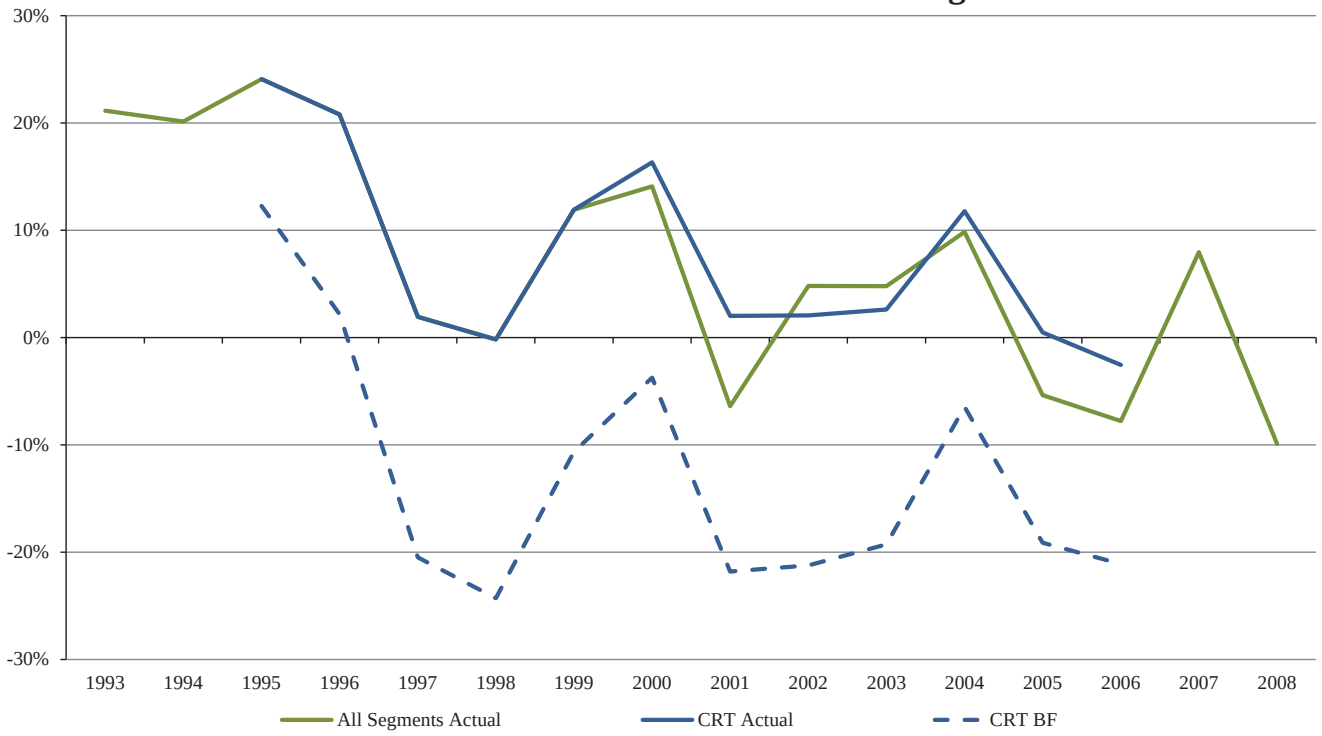
Note(s): Monochrome CRTs excluded from CDTs for the purpose of this case..
1993-1999 CRT actual gross margins assumes All Segments gross margins.
75% of the overcharge was applied to 1995 because alleged cartel period started in 1995Q2.
CRT but-for (BF) margins assume All Segments' shares of net sales for 1995-99 gross income.
CRT BF margins assume weighted average of Dr. Netz CDT/CPT overcharges by CDT/CPT sales.
Most recently reported figures used whenever possible.

Data Sources(s): Chunghwa Annual Reports & certified translations; CHWA00256934 - CHWA00256937; Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibit 65.

Source File(s): Sensitivity Table.xlsx; CHWA00256934 - HIGHLY CONFIDENTIAL.xls; a050_profit_margins.xlsx

Figure 34

Actual & But-For Chunghwa Operating Margins Based on Dr. Netz's Estimated Overcharges



Note(s): Monochrome CRTs excluded from CDTs for the purpose of this case.
75% of the overcharge was applied to 1995 because alleged cartel period started in 1995Q2.
CRT but-for margins assume CRT's share of All Segments' net sales for 1995-99 gross income, 1995-99 and 2002-06 operating expenses, and 2000-01 non-R&D operating expenses.
CRT but-for margins assume weighted average of Dr. Netz CDT/CPT overcharges by CDT/CPT sales mix.
Most recently reported figures used whenever possible.
Data Sources(s): Chunghwa Annual Reports & certified translations; CHWA00256934 - CHWA00256937; Expert Report of Janet S. Netz, April 15, 2014, Exhibit 65.
Source File(s): Sensitivity Table.xlsx; CHWA00256934 - HIGHLY CONFIDENTIAL.xls; a050_profit_margins.xlsx

136. In addition, even operating margins do not take into account additional categories of costs that CDT manufacturers incur such as taxes, and also do not take account of any required return on a firm's capital investments. To address these issues, economists sometimes calculate "economic profit" which can be estimated as the firm's net operating profit after taxes less the cost of capital. The cost of capital often is estimated by multiplying a weighted cost of debt and equity capital (or "WACC") times the average amount of capital employed during a given year.[195] These additional costs would also need to be subtracted from the operating margins above to reflect this required return on capital.

[195] See, e.g.,

- Richard A. Brealey, Stewart C. Myers, and Franklin Allen (1988) Principles of Corporate Finance, 3rd ed., McGraw-Hill Irwin, at 393-394, 451-455.
- Tom Copeland, Tim Koller and Jack Murrin, (1995) Valuation: Measuring and Managing the Value of Companies, University Edition, Second Edition, McKinsey & Company, Chapters 6, 8.

Table 9

Actual and But-For Gross Margins Based on Dr. Netz's Estimated Overcharges

Company	Segment	Margin	Actual/BF Restruct.	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Chunghwa	All	GM	Actual	12.5%	14.2%	19.0%	22.4%	26.2%	24.8%	27.9%	25.9%	9.4%	7.2%
Chunghwa	CRT	GM	Actual	12.5%	14.2%	19.0%	22.4%	26.2%	24.8%	27.9%	25.9%	9.4%	7.2%
Chunghwa	CDT+CPT	GM	Actual	12.5%	14.2%	19.0%	22.4%	26.2%	24.8%	27.0%	25.9%	7.2%	9.2%
Chunghwa	CDT	GM	Actual							30.3%	27.9%	6.0%	9.0%
Toshiba	CDT	GM	Actual								11.1%	1.3%	1.0%
Chunghwa	CRT	GM	BF							16.6%	8.4%	-11.3%	-15.1%
Chunghwa	CDT+CPT	GM	BF							15.6%	8.5%	-14.1%	-12.7%
Chunghwa	CDT	GM	BF							16.4%	7.5%	-20.6%	-16.7%
Toshiba	CDT	GM	BF								-14.1%	-26.7%	-27.1%

Company	Segment	Margin	Actual/BF Restruct.	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Chunghwa	All	GM	Actual	18.1%	19.9%	1.6%	10.8%	11.2%	15.6%	1.7%	0.2%	15.3%	1.4%
Chunghwa	CRT	GM	Actual	18.1%	21.1%	8.3%	8.0%	9.0%	17.6%	7.6%	5.5%	-5.6%	-3.7%
Chunghwa	CDT+CPT	GM	Actual	20.7%	19.3%	8.3%	7.3%	9.3%	16.9%	7.3%	5.4%	-5.6%	-3.7%
Chunghwa	CDT	GM	Actual	23.4%	22.5%	11.0%	10.7%	12.4%	20.8%	9.7%	6.2%		
LPD	All	GM	Actual			11.1%	17.5%	17.7%	18.5%	12.8%			
Toshiba	CDT	GM	Actual	2.0%									
Chunghwa	CRT	GM	BF	-2.9%	2.2%	-14.0%	-13.8%	-11.4%	0.5%	-10.6%	-11.7%		
Chunghwa	CDT+CPT	GM	BF	0.3%	-0.1%	-14.0%	-14.7%	-11.1%	-0.2%	-11.0%	-11.7%		
Chunghwa	CDT	GM	BF	1.7%	0.5%	-14.3%	-14.6%	-12.4%	-1.6%	-15.8%	-20.5%		
LPD	All	GM	BF			-2.0%	6.1%	6.5%	7.3%	1.7%			
Toshiba	CDT	GM	BF	-25.8%									

Note(s): LPD (2005) and Toshiba (1999) values are forecasts.
For Chunghwa, Monochrome CRTs excluded from CDTs for the purpose of this case.
Chunghwa CRT gross margins assume Chunghwa All Segments gross margins for 1989-99.
Chunghwa "CDT+CPT" gross margins assume Chunghwa All Segments gross margins for 1989-94, CHWA00256934 "CDT + CPT" for 1995-06, and Chunghwa CRT gross margins for 2007-08.
Chunghwa CRT but-for (BF) margins assume All Segments' shares of net sales for 1995-99 gross income.
Chunghwa CRT BF margins assume weighted average of Dr. Netz CDT/CPT overcharges by CDT/CPT sales mix.
75% of the overcharge was applied to 1995 because alleged cartel period started in 1995Q2.
Most recently reported figures used whenever possible.

Data Source(s): Expert Report of Janet S. Netz, April 15, 2014, Exhibit 65; Chunghwa Annual Reports & certified translations; CHWA00256934 - CHWA00256937; LPD Annual Reports; Investigation of the Causes of the Bankruptcy of LG.Philips Displays; TAEC00105573.

Source File(s): Sensitivity Table.xlsx; CHWA00256934 - HIGHLY CONFIDENTIAL.xls; 012_LPD-NL00214482.PDF; LPD-NL00214381.PDF; 066_Part 2 - 2009-04-20 - Investigation of the Causes of the Bankruptcy of LG Philips Displays.PDF; taec00105573.ppt; a050_profit_margins.xlsx

Table 10

Actual and But-For Operating Margins Based on Dr. Netz's Estimated Overcharges

Company	Segment	Margin	Actual/BF	Restruct.	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Chunghwa	All	OM	Actual		9.8%	11.2%	14.1%	17.9%	21.1%	20.1%	24.1%	20.8%	1.9%	-0.2%
Chunghwa	CRT	OM	Actual								24.1%	20.8%	1.9%	-0.2%
SDI	CRT	Pretax	Actual			7.3%	8.3%	9.0%	7.7%	8.6%	10.0%	7.8%	3.0%	4.3%
Chunghwa	CRT	OM	BF								12.3%	2.2%	-20.5%	-24.3%
SDI	CRT	Pretax	BF								-1.7%	-9.1%	-14.9%	-13.4%

Company	Segment	Margin	Actual/BF	Restruct.	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Chunghwa	All	OM	Actual		11.9%	14.1%	-6.4%	4.8%	4.8%	9.9%	-5.4%	-7.8%	8.0%	-9.9%
Chunghwa	CRT	OM	Actual		11.9%	16.3%	2.0%	2.1%	2.6%	11.8%	0.5%	-2.5%		
LPD	All	OM	Actual				-14.1%	-9.2%	-20.7%	-1.0%	-26.2%			
LPD	All	OM	Actual	excl.			-6.4%	3.7%	3.1%	7.0%	1.0%			
LPD	CDT	OM	Actual					-18.6%	-17.3%	10.6%				
LPD	CDT	OM	Actual	excl.				2.0%	3.2%	10.7%	4.9%			
SDI	CRT	Pretax	Actual		5.1%	14.6%	13.0%	12.1%	11.4%					
Chunghwa	CRT	OM	BF		-10.7%	-3.7%	-21.8%	-21.2%	-19.3%	-6.5%	-19.1%	-21.1%		
LPD	All	OM	BF				-30.9%	-24.3%	-37.0%	-14.8%	-42.3%			
LPD	All	OM	BF	excl.			-22.0%	-9.6%	-10.0%	-5.6%	-11.7%			
LPD	CDT	OM	BF					-52.2%	-50.6%	-14.7%				
LPD	CDT	OM	BF	excl.				-25.8%	-24.2%	-14.6%	-22.1%			
SDI	CRT	Pretax	BF		-13.1%	-2.2%	-2.9%	-3.1%	-3.0%					

Note(s): LPD (2005) values are forecasts.
For Chunghwa, Monochrome CRTs excluded from CDTs for the purpose of this case.
Chunghwa CRT but-for (BF) margins assume All Segments' shares of net sales for 1995-99 gross income, 1995-99 and 2002-06 operating expenses, and 2000-01 non-R&D operating expenses.
Chunghwa CRT BF margins assume weighted average of Dr. Netz CDT/CPT overcharges by CDT/CPT sales mix.
75% of the overcharge was applied to 1995 because alleged cartel period started in 1995Q2.
Most recently reported figures used whenever possible.

Data Source(s): Expert Report of Janet S. Netz, April 15, 2014, Exhibit 65; Chunghwa Annual Reports & certified translations; CHWA00256934 - CHWA00256937; LPD Annual Reports; Investigation of the Causes of the Bankruptcy of LG.Philips Displays; SDCRT-0203634-SDCRT-0203664, at 3652E-3653E.

Source File(s): Sensitivity Table.xlsx; CHWA00256934 - HIGHLY CONFIDENTIAL.xls; 012_LPD-NL00214482.PDF; LPD-NL00214381.PDF; 066_Part 2 - 2009-04-20 - Investigation of the Causes of the Bankruptcy of LG Philips Displays.PDF; SDCRT-0203634-Highly Confidential_Translation CERT.2.pdf; a050_profit_margins.xlsx

137. Dr. Netz appears to argue that CDT prices did not need to cover full costs to induce CDT manufacturers to continue supplying products to the marketplace because the CDT industry was a "sick industry" with substantial sunk costs.[196] However, the evidence shows that many CDT manufacturers continued to make substantial new investments throughout much of the alleged cartel period.[197] Manufacturers would not have made new investments in the industry unless they believed that they would be able to earn at least a normal economic return on such investments. Accordingly, investments of the same scope and magnitude would have been highly

[196] Netz Expert Report, at 18-21.

[197] See, e.g.

- Dr. Netz recognizes that "Adding capacity to an existing plant was also expensive. In addition, CRT manufacturing required substantial ongoing investments in capital." Netz Expert Report, at 14-15. She also cites the following examples: LG's investment plans for updating existing lines to produce its "Flatron" real flat CRTs ranged from 22 billion to 68 billion Won (at an exchange of 1200 Won per dollar, these convert to $18 million to $56 million). Salomon Smith Barney Inc., 22 May 2001, Project Mercury Confidential Information Memorandum, EIN0017699 - EIN0018075, at 7842.
- Toshiba invested over $150 million in its existing Horseheads, NY CRT plant in the five years up to March 2003. Panasonic, 27 March 2003.
- The above Toshiba investment is in addition to $220 million spent in the mid-1980s refurbishing and expanding the same facility. Kenney, Martin, Undated, The Shifting Value Chain: "The Television Industry in North America," in Locating Global Advantage, (Stanford: Stanford University Press, 2004) Chapter 4.

unlikely in Dr. Netz's but-for world where she argues that prices would have been 22 percent lower than those that prevailed in the actual world. To the extent that some of the investment that occurred in the actual world would not have occurred in Dr. Netz's but-for world, this would have the effect of raising prices, reducing product innovation or variety or having other effects that would harm consumers. Dr. Netz fails to take account of the effects of her alleged overcharges on CDT manufacturers' investment incentives and, hence, the potential adverse economic effects on CDT consumers due to these reduced investments that would have occurred in her but-for world.[198]

138. Most obviously, as shown in Figures 26-29 above, large manufacturer investments caused overall CDT production and capacity to increase substantially until approximately 2000. Thereafter, several CDT manufacturers continued to make significant investments to a) build/upgrade capacity for producing larger monitor sizes; b) invest in other product improvements, such as the transition from curved CRTs to flat CRTs and higher resolution CDTs;[199] and c) invest in relocating production capacity to lower cost regions.[200] These significant continuing investments are consistent with the fact that Dr. Netz recognized in her report that "Adding

[198] The fact that several CDT manufacturers exited the industry during the alleged cartel period also indicates that such firms did not believe they were earning a sufficient return on capital, even in the actual world. It is likely that such firms would have exited the industry even earlier in Dr. Netz's but-for world.

[199] CDT manufacturers were forced to incur product development costs and to retool production lines in order to produce the flat CDT models and make other improvements demanded by the marketplace. See, e.g.,

- One SDI document indicated that SDI's sales of flat CDTs increased from zero percent in 1996 to 54.4 percent by 2003. SDCRT-0203634 - SDCRT-0203664, at 3651E.
- Another document indicates that Hitachi was "concentrating on a line-up of higher value products such as short length tubes, flat faced products and larger format (19" and above) CRTs." HEDUS-CRT00169116 - HEDUS-CRT00169137, at 9116.
- A 2003 document shows LG adding a 19-inch flat CDT line in April 2002, SDI adding 17-inch flat CDT lines in August 2001, and Chunghwa adding a 21-inch flat CDT line in March 2002. 06 February 2003, PHLP-CRT-015235.
- Chunghwa's financial statements report CRT related capital expenditure of $649 million from 1999 to 2006. See my backup file "a057_chunghwa_crt_capex.xls."

[200] See, e.g.,

- LPD: "Although management and supervisors have annually restructured, a much more rapid closure of the factories in the high-wage countries (in particular former Philips factories in Europe) would – in retrospect – have been appropriate. This is all the more persuasive given that in the annual report of 2001 it was already stated that, in connection with the need to produce at as low costs as possible, rapid migration was needed to production countries with lower costs." A.A.M. Deterink, Investigation of the Causes of the Bankruptcy of LG.Philips Displays, 20 April 2009, at 20.
- LPD's Fei Ma Project in China "concerned the closure of the factories in Taiwan and moving the Taiwanese CDT lines to one of the Chinese joint ventures in Nanjing. In addition, 1 or 2 Jumbo lines would be installed in Hua Fei. LPD aimed at completion of this project in 2001. The (capital) expenditure associated with the Fei Ma Project was budgeted at USD 80 million. The implementation of these three restructuring projects should eventually result in a 25% reduction of labour costs over a period of five years." A.A.M. Deterink, Investigation of the Causes of the Bankruptcy of LG.Philips Displays, 20 April 2009, at 155.
- A 2000 TAEC document describes CDT plans of "Toshiba Japan moving portions of production from Japan to Thailand and China to save cost." TAEC-CRT-00074796 - TAEC-CRT-00074831, at 4815.
- Numerous "line status reports" cited by Dr. Netz discuss examples or relocating CDT lines to lower cost countries. See e.g. footnote 137.

capacity to an existing plant was also expensive" and that "CRT manufacturing required substantial ongoing investments in capital."[201]

139. In light of the substantial losses implied by Dr. Netz's overcharge estimates as shown above, it makes no economic sense that the CDT manufacturers would have continued to make the same magnitude of investments that they made in the actual world if prices had been reduced by the 22 percent overcharges implied by the Netz model.



Margaret E. Guerin-Calvert

August 5, 2014

[201] Netz Expert Report, at 15.

APPENDIX A: CURRICULUM VITAE OF MARGARET E. GUERIN-CALVERT

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EDUCATION

1976	A.B., Economics, Brown University
1979	M.P.A., (Masters in Public Affairs), Woodrow Wilson School of Public and International Affairs, Princeton University

PROFESSIONAL EXPERIENCE

2012-present	Senior Consultant, Compass Lexecon, and President, Center for Healthcare Economics and Policy and Senior Managing Director, FTI Consulting, Inc.
2008-2012	Vice Chairman and Senior Managing Director, Compass Lexecon (formerly Competition Policy Associates)
2003-2008	President, Competition Policy Associates (As of January 2006, also Senior Managing Director, FTI Consulting Inc.)
1994-2003	Principal, Economists Incorporated
1990-1994	Assistant Chief, Economic Regulatory Section, Economic Analysis Group, Antitrust Division, U.S. Department of Justice
1987-1990	Senior Economist, Economists Incorporated
1986-1987	Director of Analytical Resources Unit, Economic Analysis Group, Antitrust Division
1985-1986	Economist, Economic Analysis Group, Antitrust Division, U.S. Department of Justice

1982-1985	Economist, Financial Structure Section, Division of Research and Statistics, Board of Governors of the Federal Reserve System
1979-1982	Economist, Economic Policy Office, Antitrust Division, U.S. Department of Justice
1976-1977	Research Associate, Energy Economics Group, Arthur D. Little, Inc.

TEACHING EXPERIENCE

1984	Adjunct Lecturer, Institute of Policy Sciences, Duke University
1984-1989	Executive Education for Top State Managers, conducted by The Institute of Policy Sciences, Duke University
1983	Lecturer, Board of Governors of the Federal Reserve System and American Institute of Banking
1979	Teaching Assistant, Princeton University

TESTIMONY

Investigation into the Competitive Marketing of Air Transportation, CAB

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In Re "Apollo" Air Passenger Computer Reservation System (CRS) MDL DKT. No. 760 M-21-49-MP

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Report of Robert D. Willig and Margaret E. Guerin-Calvert to the NZCC *An Economic Assessment of Professor Tim Hazledine's Model of the Proposed Alliance Between Qantas and Air New Zealand*

Presentations by Robert D. Willig and Margaret E. Guerin-Calvert to the NZCC *An Economic Analysis of the Consumer Benefits and Competitive Effects of the Proposed Alliance Between Qantas Airways and Air New Zealand; Consumer Benefits*

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"Assessment of Cost Trends and Price Differences for U.S. Hospitals," (with Guillermo Israilevich), March 2011

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"A Critique of Recent Publications Claiming Provider Market Power," (with Guillermo Israilevich), October 2010

Presentation at the Antitrust Masters Course V, Section of Antitrust Law, American Bar Association, Williamsburg, VA, September 2010, *Using Economists and Other Experts*

"U.S. Antitrust Law Developments," *Canadian Competition Record*, Winter 2009

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OTHER PROFESSIONAL ACTIVITIES

Member, International Task Force, Section of Antitrust Law, American Bar Association and its Committees, including Healthcare and Pharmaceuticals

Member, American Economics Association

PAST PROFESSIONAL ACTIVITIES

Chair, Interagency Task Force on Bank Competition (at the U.S. Department of Justice, Antitrust Division)

Co-Chair, Economics Task Force, Member, Technology and Financial Resources Task Force, Chair of the Membership Committee, Transition Task Force Member, Chair of the Exemptions and Immunities Task Force, Council Member, Chair, Financial Markets and Institutions Committee, Member Advisory Board on Section Reserves, Long Range Planning Committee, Section of Antitrust Law, American Bar Association

APPENDIX B: MATERIALS RELIED UPON BY MARGARET E. GUERIN-CALVERT

Legal Filings

January 10, 2013, Indirect Purchaser Plaintiffs' Fourth Consolidated Amended Complaint, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division)

Janet S. Netz, Ph.D., May 25, 2011, Expert Report of Janet S. Netz, Ph.D., In re: TFT-LCD (Flat Panel) Antitrust Litigation, (United States District Court Northern District of California San Francisco Division)

Janet S. Netz, Ph.D., October 1, 2012, Declaration of Janet S. Netz, Ph.D., In Support of Motion of Indirect-Purchaser Plaintiffs for Class Certification, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division)

Janet S. Netz, Ph.D., February 15, 2013, Declaration of Janet S. Netz, Ph.D., in Support of Indirect-Purchaser Plaintiffs' Opposition to Defendants' Motion to Strike the Proposed Expert Testimony of Dr. Janet S. Netz, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division)

Janet S. Netz, Ph.D., February 15, 2013, Rebuttal Declaration of Janet S. Netz, Ph.D., in Support of Motion of Indirect-Purchaser Plaintiffs for Class Certification, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division)

Janet S. Netz, Ph.D., April 15, 2014, Expert Report and Backup of Janet S. Netz, Ph.D., In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division)

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Robert D. Willig, December 17, 2012, Expert Report of Robert D. Willig, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division)

Robert D. Willig, March 25, 2013, Rebuttal Declaration of Professor Robert D. Willig In Support of Defendants' Motion to Strike The Proposed Expert Testimony of Dr. Janet S. Netz, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division)

Robert D. Willig, August 5, 2014, Expert Report of Robert D. Willig, Indirect Purchaser Class Action, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division)

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Depositions

Deposition of Deok-Yun Kim, Vol. 1, March 27, 2013

Deposition of Deok-Yun Kim, Vol. 2, March 28, 2013

Deposition of Deok-Yun Kim, Vol. 3, March 29, 2013

Deposition of Hoon Choi, Vol. 1, June 19, 2013

Deposition of Hoon Choi, Vol. 2, June 20, 2013

Deposition of Hoon Choi, Vol. 3, June 21, 2013

Deposition of Hun Sul Chu, Vol. 1, February 11, 2014

Deposition of Hun Sul Chu, Vol. 2, February 12, 2014

Deposition of Hun Sul Chu, Vol. 3, February 13, 2014

Deposition of In Hwan Song, Vol. 1, December 12, 2012

Deposition of In Hwan Song, Vol. 2, December 13, 2012

Deposition of Jae In Lee, Vol. 1, July 24, 2013

Deposition of Jae In Lee, Vol. 2, July 25, 2013

Deposition of Jae In Lee, Vol. 3, July 26, 2013

Deposition of Janet S. Netz, June 27, 2014

Deposition of Jun Yeol Youn, Vol. 1, September 11, 2013

Deposition of Jun Yeol Youn, Vol. 2, September 12, 2013

Deposition of Jun Yeol Youn, Vol. 3, September 13, 2013

Deposition of Kazuhiro Nishimaru, Vol. 1, June 26, 2013

Deposition of Kenneth G. Elzinga, Ph.D., July 17, 2014

Deposition of SDI 30(b)(6) Witness Jaein Lee, Vol. 1, June 6, 2012

Deposition of SDI 30(b)(6) Witness Jaein Lee, Vol. 2, June 7, 2012

Deposition of Tatsuo Tobinaga, Vol. 1, July 16, 2012

Deposition of Tatsuo Tobinaga, Vol. 2, July 16, 2012

Deposition of Yu-Hao Zhang, A.K.A. Allen Chang, Vol. 1, March 12, 2014

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Bates Stamped Documents

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CHU00014202 - CHU00014206

CHU00028589 - CHU00028590

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SDCRT-0088852 - SDCRT-0088856

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Netz Target Price Documents

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TSB-CRT-00036875

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Source Files

065_Part 1 - 2009-04-20 - Investigation of the Causes of the Bankruptcy of LG Philips Displays.PDF

066_Part 2 - 2009-04-20 - Investigation of the Causes of the Bankruptcy of LG Philips Displays.PDF

all_defendants_dropexout_collapsed.dta

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capacity_db_linetype.dta

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clean_target.dta

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combine_target_defendant.dta

HDP-CRT00019322_rough_translation.xls

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SDCRT-0201291.dta

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target_index.dta

Target price-structure.xlsx

total production.do

total production.xlsx

vendor_map.do

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APPENDIX B: MATERIALS RELIED UPON BY MARGARET E. GUERIN-CALVERT

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Martin Kenney, "The Shifting Value Chain: The Television Industry in North America," in *Locating Global Advantage*, (Stanford: Stanford University Press, 2004) Chapter 4

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APPENDIX C: SUMMARY OF CDT PRODUCTS BY SIZE AND QUARTER

CDT Quarterly Price Summary

Year	Quarter	Size	Number of Models	[a] 5th Percentile Price	[b] 95th Percentile Price	[c] Weighted Average Price	(b - a) / c Price Variation
1996	1	14	128	$49.08	$107.39	$91.52	64%
		15	66	$125.03	$164.30	$148.14	27%
		17	47	$196.43	$288.22	$252.54	36%
	2	14	121	$49.53	$107.00	$96.64	59%
		15	64	$129.65	$168.81	$141.95	28%
		17	41	$183.04	$280.13	$251.66	39%
	3	14	106	$77.91	$104.75	$92.28	29%
		15	80	$101.89	$160.14	$132.31	44%
		17	45	$174.07	$278.25	$230.77	45%
	4	14	111	$59.00	$92.10	$78.38	42%
		15	95	$96.53	$156.89	$117.72	51%
		17	47	$169.94	$274.97	$223.72	47%
1997	1	14	122	$49.35	$86.50	$64.01	58%
		15	88	$84.02	$141.47	$101.11	57%
		17	50	$157.95	$246.27	$210.82	42%
	2	14	128	$40.90	$100.50	$61.18	97%
		15	96	$79.38	$143.45	$100.06	64%
		17	82	$149.50	$252.85	$210.62	49%
	3	14	116	$40.90	$69.00	$54.57	51%
		15	107	$64.00	$125.78	$83.55	74%
		17	94	$131.00	$251.67	$195.21	62%
		19	7	$289.61	$358.80	$314.19	22%
	4	14	138	$40.41	$74.23	$52.72	64%
		15	115	$59.62	$125.77	$72.33	91%
		17	123	$125.66	$205.71	$161.77	49%
		19	13	$264.05	$337.13	$286.70	25%

APPENDIX C: SUMMARY OF CDT PRODUCTS BY SIZE AND QUARTER

CDT Quarterly Price Summary

				[a]	[b]	[c]	(b - a) / c
Year	Quarter	Size	Number of Models	5th Percentile Price	95th Percentile Price	Weighted Average Price	Price Variation
1998	1	14	187	$35.25	$63.20	$50.16	56%
		15	218	$51.38	$91.06	$63.46	63%
		17	229	$103.10	$203.72	$133.73	75%
		19	26	$218.82	$301.64	$243.68	34%
	2	14	207	$32.32	$51.50	$42.36	45%
		15	226	$43.80	$73.70	$51.99	58%
		17	248	$87.00	$167.55	$107.15	75%
		19	38	$188.95	$242.26	$206.65	26%
	3	14	173	$30.00	$50.50	$43.08	48%
		15	286	$43.73	$70.33	$53.49	50%
		17	274	$77.71	$128.00	$95.24	53%
		19	55	$169.56	$222.15	$183.75	29%
	4	14	117	$37.00	$61.80	$48.74	51%
		15	291	$52.00	$69.69	$61.00	29%
		17	330	$85.00	$140.24	$97.94	56%
		19	64	$175.28	$252.21	$199.01	39%
1999	1	14	97	$42.15	$59.00	$47.27	36%
		15	275	$57.03	$80.73	$62.04	38%
		17	261	$88.00	$146.22	$98.51	59%
		19	74	$130.62	$238.13	$191.36	56%
	2	14	81	$42.00	$107.46	$46.82	140%
		15	253	$57.21	$67.00	$61.23	16%
		17	264	$88.00	$128.06	$97.22	41%
		19	90	$152.33	$205.87	$174.84	31%
	3	14	84	$44.15	$53.96	$48.45	20%
		15	257	$56.56	$73.73	$62.45	27%
		17	292	$86.57	$139.77	$93.49	57%
		19	82	$144.00	$191.78	$159.60	30%
	4	14	77	$46.00	$56.87	$49.62	22%
		15	221	$57.48	$70.26	$62.76	20%
		17	251	$81.38	$122.96	$90.82	46%
		19	74	$130.19	$182.37	$145.91	36%

APPENDIX C: SUMMARY OF CDT PRODUCTS BY SIZE AND QUARTER

CDT Quarterly Price Summary

				[a]	[b]	[c]	(b - a) / c
Year	Quarter	Size	Number of Models	5th Percentile Price	95th Percentile Price	Weighted Average Price	Price Variation
2000	1	14	74	$46.00	$61.00	$49.63	30%
		15	190	$58.53	$84.62	$62.84	42%
		17	294	$81.61	$118.13	$87.03	42%
		19	87	$119.64	$191.25	$135.66	53%
	2	14	65	$46.00	$83.59	$49.14	76%
		15	166	$57.11	$70.21	$61.89	21%
		17	283	$79.85	$108.48	$84.73	34%
		19	83	$115.00	$160.05	$133.46	34%
	3	14	70	$47.00	$58.00	$50.05	22%
		15	159	$56.00	$71.74	$60.94	26%
		17	289	$79.00	$110.02	$86.45	36%
		19	83	$107.48	$156.91	$132.00	37%
	4	14	66	$46.55	$61.30	$49.63	30%
		15	133	$54.14	$71.18	$59.93	28%
		17	303	$72.88	$108.22	$84.82	42%
		19	72	$105.19	$150.35	$127.07	36%
2001	1	14	51	$44.00	$55.00	$48.01	23%
		15	135	$49.60	$68.12	$54.83	34%
		17	271	$67.17	$95.46	$77.26	37%
		19	71	$92.45	$145.00	$109.31	48%
	2	14	49	$40.33	$56.00	$43.32	36%
		15	123	$42.04	$64.50	$47.60	47%
		17	306	$61.37	$86.00	$69.94	35%
		19	85	$85.00	$129.60	$94.29	47%
	3	14	45	$37.93	$52.00	$41.51	34%
		15	123	$38.45	$59.68	$43.22	49%
		17	297	$56.33	$79.54	$62.34	37%
		19	98	$76.28	$127.26	$83.70	61%
	4	14	34	$37.71	$49.78	$40.28	30%
		15	112	$36.00	$49.47	$40.52	33%
		17	284	$50.01	$70.00	$58.50	34%
		19	114	$74.08	$111.81	$82.02	46%

APPENDIX C: SUMMARY OF CDT PRODUCTS BY SIZE AND QUARTER

CDT Quarterly Price Summary

				[a]	[b]	[c]	(b - a) / c
Year	Quarter	Size	Number of Models	5th Percentile Price	95th Percentile Price	Weighted Average Price	Price Variation
2002	1	14	22	$36.81	$46.00	$38.50	24%
		15	121	$36.00	$49.00	$42.04	31%
		17	273	$48.54	$69.96	$58.26	37%
		19	109	$73.35	$105.00	$82.32	38%
	2	14	20	$35.77	$41.72	$38.11	16%
		15	157	$35.35	$57.00	$39.75	54%
		17	271	$49.00	$67.74	$58.50	32%
		19	109	$69.50	$102.33	$83.30	39%
	3	14	16	$37.00	$40.00	$38.30	8%
		15	141	$30.89	$49.00	$39.27	46%
		17	306	$46.00	$63.61	$54.13	33%
		19	127	$66.35	$95.00	$77.33	37%
	4	14	9	$30.00	$39.03	$34.20	26%
		15	107	$30.46	$47.68	$37.11	46%
		17	302	$41.28	$59.75	$50.16	37%
		19	138	$63.87	$92.87	$75.18	39%
2003	1	14	5	$29.18	$51.00	$36.69	59%
		15	110	$33.43	$42.70	$36.63	25%
		17	277	$43.50	$56.06	$49.39	25%
		19	122	$65.13	$85.54	$77.19	26%
	2	14	4	$29.77	$32.00	$30.10	7%
		15	112	$32.00	$42.13	$35.64	28%
		17	282	$42.35	$56.00	$48.19	28%
		19	114	$62.28	$83.11	$75.27	28%
	3	14	3	$29.60	$29.60	$29.60	
		15	101	$30.17	$41.27	$34.66	32%
		17	291	$40.09	$52.64	$46.14	27%
		19	118	$58.08	$81.84	$72.05	33%
	4	14	3	$31.00	$31.00	$31.00	
		15	100	$28.61	$39.24	$33.73	32%
		17	302	$41.00	$51.65	$44.50	24%
		19	110	$58.66	$77.09	$70.44	26%

APPENDIX C: SUMMARY OF CDT PRODUCTS BY SIZE AND QUARTER

CDT Quarterly Price Summary

				[a]	[b]	[c]	(b - a) / c
Year	Quarter	Size	Number of Models	5th Percentile Price	95th Percentile Price	Weighted Average Price	Price Variation
2004	1	14	2	$29.90	$29.90	$29.90	
		15	94	$31.20	$38.92	$33.91	23%
		17	312	$39.30	$50.00	$44.18	24%
		19	106	$60.45	$76.58	$70.21	23%
	2	14	3	$30.53	$30.53	$30.53	
		15	79	$32.40	$42.08	$35.25	27%
		17	267	$40.94	$52.12	$46.07	24%
		19	111	$58.27	$78.83	$70.08	29%
	3	14	3				
		15	88	$33.20	$44.40	$37.05	30%
		17	248	$40.50	$52.67	$47.04	26%
		19	95	$63.30	$78.94	$71.28	22%
	4	14	2				
		15	82	$33.11	$43.00	$37.09	27%
		17	260	$39.50	$52.56	$45.92	28%
		19	87	$58.51	$77.12	$69.71	27%
2005	1	14	1				
		15	62	$31.39	$41.31	$36.67	27%
		17	208	$38.45	$50.60	$44.44	27%
		19	75	$63.04	$74.61	$67.56	17%
	2	14	1	$45.00	$45.00	$45.00	
		15	55	$30.00	$41.00	$34.37	32%
		17	200	$36.50	$48.00	$42.84	27%
		19	63	$59.39	$70.69	$63.60	18%
	3	15	61	$26.77	$37.97	$32.67	34%
		17	204	$34.35	$46.00	$39.43	30%
		19	44	$49.50	$70.82	$60.69	35%
	4	14	2				
		15	57	$27.42	$40.28	$31.68	41%
		17	179	$32.96	$44.50	$38.34	30%
		19	41	$51.53	$67.86	$59.11	28%

APPENDIX C: SUMMARY OF CDT PRODUCTS BY SIZE AND QUARTER

CDT Quarterly Price Summary

				[a]	[b]	[c]	(b - a) / c
Year	Quarter	Size	Number of Models	5th Percentile Price	95th Percentile Price	Weighted Average Price	Price Variation
2006	1	14	2				
		15	55	$27.97	$37.65	$31.46	31%
		17	211	$32.42	$42.02	$38.02	25%
		19	50	$44.14	$66.15	$58.41	38%
	2	14	1				
		15	59	$26.02	$34.02	$30.79	26%
		17	202	$31.40	$41.72	$37.02	28%
		19	42	$53.15	$65.26	$56.43	21%
	3	14	1				
		15	39	$26.33	$33.16	$31.64	22%
		17	210	$31.23	$41.49	$35.84	29%
		19	38	$52.56	$67.66	$56.44	27%
	4	15	41	$26.31	$37.00	$30.81	35%
		17	158	$31.15	$42.04	$36.01	30%
		19	32	$27.87	$62.16	$53.29	64%

Note(s): Number of Models includes all finishes; price information based on ITC finish only.
Data Source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibit 64.
Source File(s): all_defendants_dropexout_collapsed.dta; input_data.do; p101_cdt_price_by_size.do; a101_cdt_price_by_size..xlsx

APPENDIX D: ADDITIONAL EXAMPLES OF ECONOMIC EVIDENCE RELATING TO THE DETERMINANTS OF CDT PRICES IN 1995-1996

- A 1995 report published by the US international Trade Commission (US ITC) provided an extensive discussion of trends in the US and international CRT industries.[1] Their discussion repeatedly emphasized factors such as:
    - rapid growth in demand, particularly for larger sizes of CRTs;
    - acute shortages of glass for CRT production;
    - substantial restructuring of CRT production facilities to meet the market demand for larger sizes of CRTs and to relocate production from high-cost regions to low-cost regions;
    - shortages of CRT production capacity;

- **Quotes from 1995 USITC Report:**
    - The glass industry supplying picture tube manufacturers has been hard pressed in recent years to keep up with demand, which now exceeds capacity in the United States. Since larger screen tubes consume more glass than smaller tubes, the trend toward larger screens means fewer tubes can be produced from the same amount of glass. The North American Free-Trade Agreement (NAFTA) may increase the demand for U.S.-made tubes at Mexican border plants, further intensifying the glass shortage. Industry shortfalls continued through 1994, when five of the seven U.S. picture tube plants were forced to shut down due to a shortage of glass.
    - Additional glass supplied by Japan has become “incredibly expensive” and Japan’s ability to act as a “safety valve...has been disappearing”. No meaningful increases in U.S. tube plant capacity are expected before 1995. The most important factor in demand for picture tubes is the consumer’s preference in screen size. There is increasing demand worldwide for large-screen (25-inch and over) direct-view televisions, leading to a shortage of large-screen picture tubes.
    - Foreign producers of CRTs face many of the same problems as do U.S. producers—product differentiation, capacity constraints, need for investment capital, and supply shortages….Because of increased demand worldwide, manufacturers are operating at or near full capacity for the production of larger screen tubes and the cost of adding more capacity for larger screen tubes is very high. Furthermore, as in the United States, glass producers are finding it difficult to keep up with demand from CRT manufacturers.
    - Japanese companies, facing of stiff competition, trade barriers, and relatively slow growth in developed countries, are continuing their drive to relocate production to East Asia. Production facilities in the developing countries of Asia offer not only lower production costs but also facilitate entry into new markets. While four picture tube plants

[1] Industry & Trade Summary, Television Picture Tubes and Other Cathode-Ray Tubes, USITC Publication 2877, May 1995.

are under construction, China is importing tubes from other countries. Most portable television manufacturers in Taiwan have suffered from insufficient supplies of CRTs, particularly color CRTs. The booming computer market encouraged CRT makers to concentrate on making more profitable units for computer monitors.

- A May 1995 presentation by LG Electronics titled "Color CRT market data" showed that monitor demand was expected to be very close to CDT supply in 1995. The document also illustrates the rapid projected increase in color monitor demand and CDT production during 1993 through 1998, as well as the rapid transition from 14" CDTs to larger sizes. This document and many others show that CDT manufacturers were investing heavily during this period to bring on new CDT capacity in light of rapid demand growth.

- An internal analysis of desktop demand, monitor production and CDT production prepared by Toshiba in 1997 shows that desktop demand and monitor production was essentially equal to CDT capacity in 1995.[2]

Other Documents & Testimony

- "Q Can you describe the condition of Toshiba's CDT business between 1994 and '96? THE WITNESS: 1994, I believe the business was not doing very well. In 1995, my recollection is that the sales were doing very well. And in 1996, perhaps because -- due to the reaction to that, the sales was not doing that well, if I recall. Q What do you mean by the reaction to that? A It was in 1995, Windows 95 became available and, therefore, quite a number of PCs were sold. In 1996, sales did not grow as had been expected, so sales was not that well, if I recall, for us."[3]

- "Bigger Windows":[4]

    - Anyone who works with large spreadsheets, multitasks in Windows, or zaps alien ships in Descent will appreciate a 17-inch display. … Last year, 17-inch models accounted for about 15 percent of the worldwide monitor market in terms of unit sales, according to Dataquest, a market research firm located in San Jose, California. By the end of this year, they will represent about 18 percent and next year, approximately 25 percent.

    - Unfortunately, while sales may be on the rise, so are some prices—at least temporarily. Several factors have contributed to, in some cases, a price rise of up to 15 percent. Shortages of the glass used for tubes and of the plastic used in chassis combined with a rise in the price of copper (which is used in significant amounts in monitors) have prevented manufacturers from lowering prices. This was further aggravated by the weakening dollar and by the disruption in distribution and manufacturing caused by the earthquake in Kobe, Japan, which diverted some of the already scarce glass into television manufacturing.

[2] TSB-CRT-00036829.
[3] June 26, 2013, Deposition of Kazuhiro Nishimaru, Volume 1, at 48-49.
[4] John R. Quain, "Bigger windows," PC Magazine, September 12, 1995, http://global.factiva.com (accessed August 3, 2014).

APPENDIX D: ADDITIONAL EXAMPLES OF ECONOMIC EVIDENCE RELATING TO THE DETERMINANTS OF CDT PRICES IN 1995-1996

- Computer Reseller News, 13 February 1995[5]
    - Resellers face tight supplies on monitors through the next several months and possibly into the fourth quarter because of strong demand, problems related to the Japanese earthquake and a market shift toward larger display sizes.
    - Most recently, manufacturers have struggled to keep up with strong demand for 21-inch monitors, which has been sparked by price reductions bringing the displays below the $2,000 level, distributors and manufacturers reported.
    - But shortages of 14-inch monitors also have been reported, and some worry the problem could spill over into larger formats. "A lot of the vendors indicate there are already shortages in the 14-inch {market} and anticipated or actual shortages in the 15-inch market, {as well as} expectations of shortages in the 17-inch market later in the year," said Rhoda Alexander, a senior analyst with market-research firm Stanford Resources Inc., San Jose, Calif.
    - Alexander said most of the shortages appeared to be linked to unexpectedly strong sales, which caught tube and monitor manufacturers by surprise. Others suggested the Japanese tube manufacturers are shifting away from 14-inch tubes because of low margins and are hoping to shift the market toward 15-inch and 17-inch models.
    - "Those markets are really booming right now, so I think that's causing {cathode-ray-tube (CRT)} manufacturers to ship larger-screen-size CRTs," said Howard Sun, marketing director for Mag InnoVision Inc., Santa Ana, Calif.
    - It is difficult to assess how big the problem is. Several manufacturers said they were having no problem getting 15-inch and 17-inch monitors but that they were benefiting from other manufacturer's difficulties. Rumors of quake-related supply problems also may be fueling some speculative fears.
    - A Mitsubishi CRT plant suffered damage to a couple of production lines, which caused two weeks of lost production, but the lines are back up now, said Bob Crooks, senior vice president of the displays division for Mitsubishi Electronics America Inc., Cypress, Calif. While causing some hiccups in the supply chain, Crooks said the problems were not major.
    - Sam Taylor, vice president of sales and marketing for Electrograph Systems Inc., a graphics distributor in Hauppauge, N.Y., said spot shortages have been ongoing for several months. "Some manufacturers will be out, and then they'll get product," he said. "It's not just one manufacturer, but it seems to roll." He said two vendors currently had 21-inch monitors on allocation. Another distributor reported Mitsubishi, Sony Corp., Nokia Consumer Electronics and NEC Technologies Inc. were in short supply on 21-inch monitors.

[5] John Longwell, “Resellers face crunch time—Monitors in short supply possibly into fourth quarter,” Computer Reseller news, February 13, 1995, http://global.factiva.com (accessed August 3, 2014).

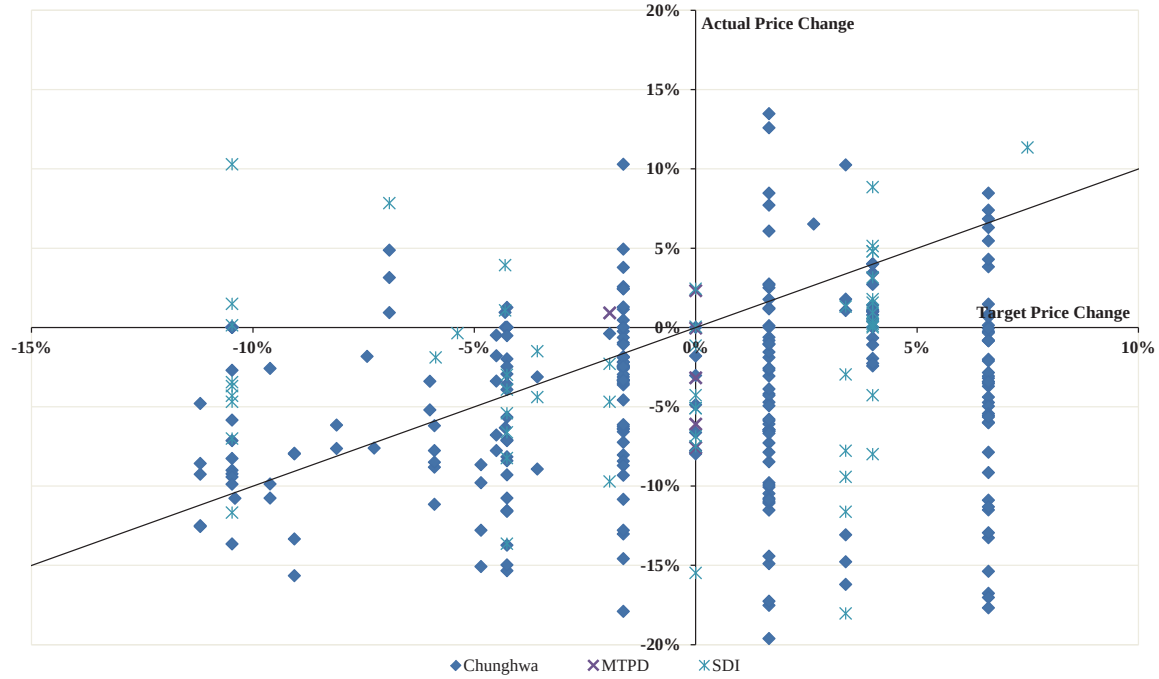
- Crooks said demand for 21-inch monitors had far-outstripped Mitsubishi's expectations. "We have drastically increased our orders to our factory, and they are working very hard to increase capacity," he said. "I would like to say it will be a matter of two or three months {before shortages ease}, but the way demand is increasing, we may be in the same situation only talking about larger numbers."

- 1995 Taiwan Business News[6]
  - Due to the current short supply of cathode ray tubes (CRTs) throughout the world, and the resulting increases in production costs for computer monitor manufacturers, monitor producers in Taiwan, Japan, and Korea have announced that export quotations will increase as of Sept. 1. Over the past year, cathode ray tube prices have risen by more than 20%, and export quotations will therefore be hiked by about 10%.

[6] "Computer monitor export quotations rise by 10%," Taiwan Business News, September 4, 1995, http://global.factiva.com (accessed August 3, 2014).

APPENDIX E: SCATTER PLOTS OF CHANGES IN TARGET PRICES AND ACTUAL PRICES BY SIZE

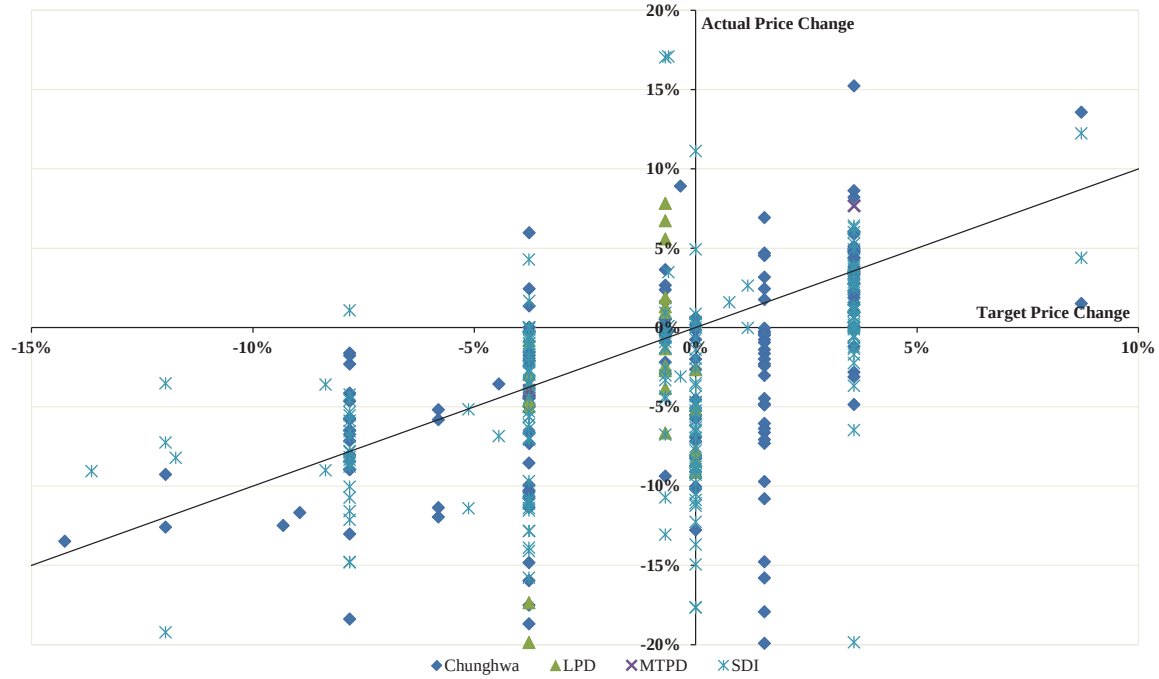
14-Inch CDT Actual and Target Price Changes by Manufacturer



Note(s): Price changes represent the compounded quarterly percentage change for a given manufacturer, factory, customer, and finish between quarters *t* and *t-x*, where *x* is defined as the smallest positive integer for which there were actual prices and target prices for the panel in quarters *t* and *t-x*. That is, the actual and target price changes were calculated over the same period of time, and *x* represents the shortest period over which this was possible. Excludes observations for which the model number, customer name, size, or finish were missing or with more than four quarters between observed pairs of actual/target price changes. A number of observations are outside the bounds of the x or y axis.
Dr. Netz's sales database inappropriately labels Panasonic Corp. as MTPD.
Data Sources(s): Defendant data; see Expert Report of Janet S. Netz April 15, 2014, Exhibit 64.
Source File(s): combine_target_defendant.dta; p051_actual_v_target_price_mfg_size.do; a051_actual_v_target_price_mfg_size.xlsx

APPENDIX E: SCATTER PLOTS OF CHANGES IN TARGET PRICES AND ACTUAL PRICES BY SIZE

15-Inch CDT Actual and Target Price Changes by Manufacturer



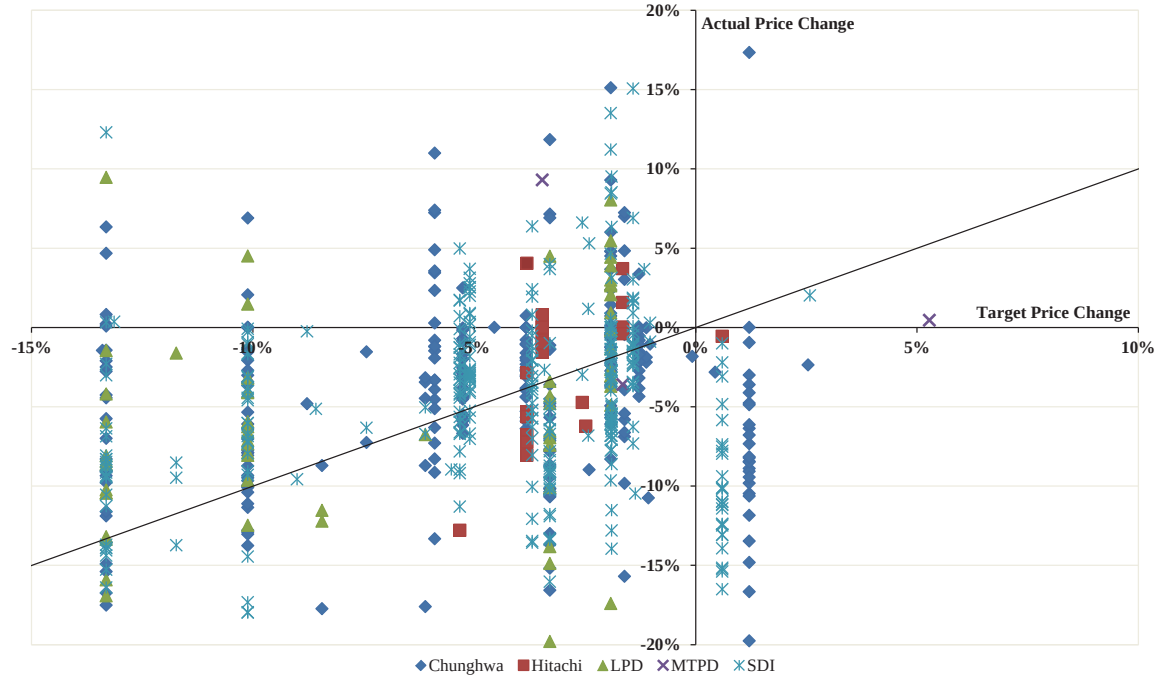
Note(s): Price changes represent the compounded quarterly percentage change for a given manufacturer, factory, customer, and finish between quarters *t* and *t-x*, where *x* is defined as the smallest positive integer for which there were actual prices and target prices for the panel in quarters *t* and *t-x*. That is, the actual and target price changes were calculated over the same period of time, and *x* represents the shortest period over which this was possible. Excludes observations for which the model number, customer name, size, or finish were missing or with more than four quarters between observed pairs of actual/target price changes. A number of observations are outside the bounds of the x or y axis.
Dr. Netz's sales database inappropriately labels Panasonic Corp. as MTPD.

Data Sources(s): Defendant data; see Expert Report of Janet S. Netz April 15, 2014, Exhibit 64.

Source File(s): combine_target_defendant.dta; p051_actual_v_target_price_mfg_size.do; a051_actual_v_target_price_mfg_size.xlsx

APPENDIX E: SCATTER PLOTS OF CHANGES IN TARGET PRICES AND ACTUAL PRICES BY SIZE

17-Inch CDT Actual and Target Price Changes by Manufacturer



Note(s): Price changes represent the compounded quarterly percentage change for a given manufacturer, factory, customer, and finish between quarters *t* and *t-x*, where *x* is defined as the smallest positive integer for which there were actual prices and target prices for the panel in quarters *t* and *t-x*. That is, the actual and target price changes were calculated over the same period of time, and *x* represents the shortest period over which this was possible. Excludes observations for which the model number, customer name, size, or finish were missing or with more than four quarters between observed pairs of actual/target price changes. A number of observations are outside the bounds of the x or y axis.
Dr. Netz's sales database inappropriately labels Panasonic Corp. as MTPD.

Data Sources(s): Defendant data; see Expert Report of Janet S. Netz April 15, 2014, Exhibit 64.

Source File(s): combine_target_defendant.dta; p051_actual_v_target_price_mfg_size.do; a051_actual_v_target_price_mfg_size.xlsx

APPENDIX F: REGRESSIONS OF QUARTERLY CHANGES IN ACTUAL CDT PRICES ON CHANGES IN TARGET PRICES

Regressions of Changes in Actual Prices on Changes in Target Prices

Row	Dependent Variable	Independent Variables			Results			Robustness Checks	
	Change in Actual Price (Level of Aggregation)	Change in Alleged Target Price (Level of Aggregation)	Change in Macroeconomic Variables	Change in Negotiated Price Currency-to-USD Exchange Rate Variables	Number of Observations	Estimated Coefficient on Change in Target Price	R-Squared	Range of Estimated Coefficients on the Change in Target Price	R-Squared Range
1	Model, Customer, Factory, Quarter	Manufacturer, Application, Size, Finish, Quarter			6,225	0.237***	0.126	0.232*** - 0.314*	0.015 - 0.132
2	Model, Customer, Factory, Quarter	Manufacturer, Application, Size, Finish, Quarter	X		6,225	0.224***	0.190	0.202*** - 0.328*	0.027 - 0.243
3	Model, Customer, Factory, Currency, Quarter	Manufacturer, Application, Size, Finish, Quarter		X	6,116	0.238***	0.163	0.228* - 0.238***	0.040 - 0.163

Sources:
(1) Global CRT sales data for Chunghwa, Daewoo, Hitachi, IRICO, LGE, LPD, Mitsubishi, MTPD, Panasonic Corporation, Philips, SDI, Samtel, Thai CRT, Thomson, and Toshiba Corp.;
(2) Netz target price data;
(3) OECD StatExtracts Database (OECD unemployment rate and industrial production), Bank of Korea (Korean CRT glass PPI), DisplaySearch (worldwide monitor sales), U.S. Federal Reserve (exchange rates).

1

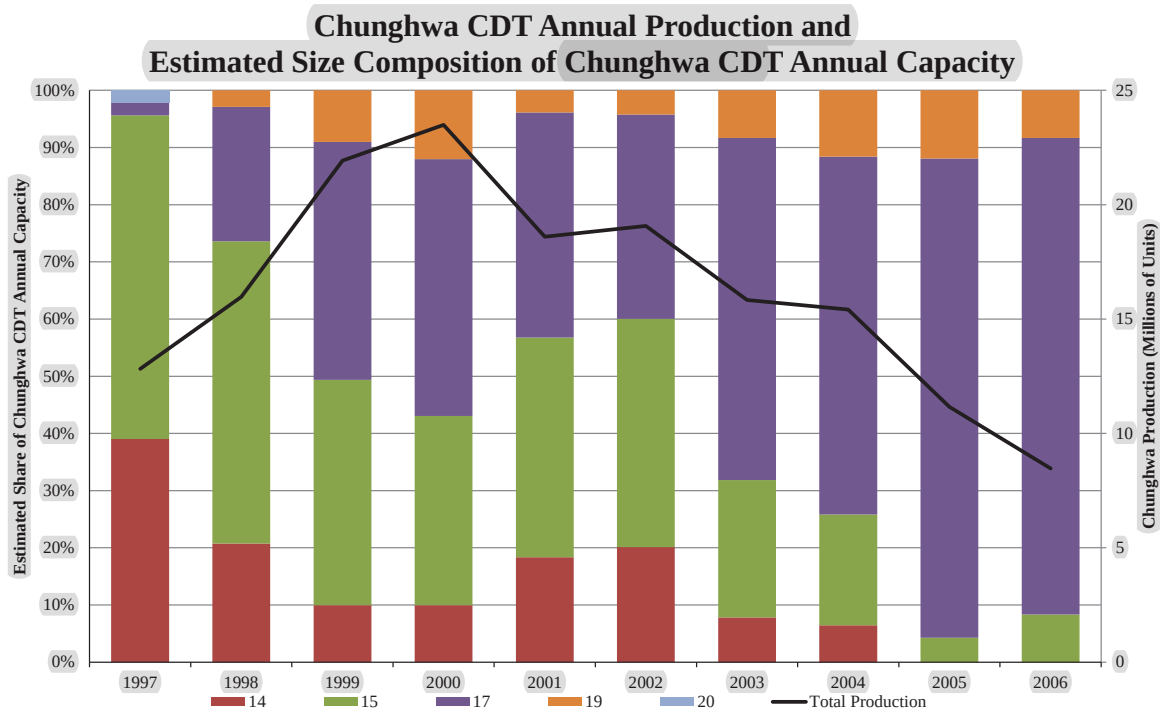
[1] See my backup file "Regressions of Changes in Actual Prices on Changes in Target Prices.xlsx."

APPENDIX F: REGRESSIONS OF QUARTERLY CHANGES IN ACTUAL CDT PRICES ON CHANGES IN TARGET PRICES

Notes:
(1) An actual price observation represents the quantity-weighted average actual price for a given model, factory, customer, and quarter (rows 1-2) or for a given model, customer, factory, the currency in which the prices were negotiated ("negotiated currency"), and quarter (row 3) using global CDT sales data for Q1 1995 to Q4 2007;
(2) A target price observation represents the average of the CDT target prices identified by Dr. Netz for a given manufacturer, size, and finish (bare/ITC), ("group") and quarter, weighted by the number of days that the target price was effective during that quarter;
(3) Actual and target price changes represent the average quarterly percentage change (divided by 100) in the actual price for a given model, factory, and customer (and negotiated currency in row 3) and the average quarterly percentage change (divided by a hundred) in the CDT target price for the group between quarters *t* and *t-x*, where *x* is defined as the smallest positive integer (possibly equal to 1) for which there were actual prices for the model-factory-customer (and currency in row 3) and target prices for the group in quarters *t* and *t-x*. That is, the actual and target prices changes were calculated over the same period of time, and *x* represents the shortest period over which this was possible;
(4) Actual prices were excluded as outliers as follows: For each quarter in which a given CDT model produced in a given factory was sold to a given customer, the average quarter-to-quarter price change was calculated between the given quarter and the previous quarter in which the same model was produced in the same factory and sold to the same customer. Price changes that were less than the 25th percentile of the distribution of price changes across all defendants minus 3 times the interquartile range of that distribution or greater than the 75th percentile of the distribution plus 3 times the interquartile range were flagged as “very large price decreases” or “very large price increases,” respectively. Prices for a given model, factory, customer, and quarter were excluded as outliers if: (a) the price for the model, factory, and customer experienced a very large decrease in the given quarter followed by a very large increase in the next quarter in which the same model was produced in the same factory and sold to the same customer, or vice versa; (b) it was the first quarter in which the model was produced at that factory and sold to that customer and the price experienced a very large increase or decrease in the next quarter in which the model was produced at that factory and sold to that customer; or (c) it was the last quarter in which the model was produced in that factory and sold to that customer and the price experienced a very large increase or decrease from the previous quarter in which the model was produced in that factory and sold to that customer;
(5) The following actual price observations were also excluded: (a) observations for which the manufacturer, application, size, finish, model number, customer name, or quarter (or currency for the model presented in row 3) were missing; (b) sales between integrated entities that sold CRTs; and (c) observations with more than four quarters between observed pairs of actual price changes and target price changes.
(6) The macroeconomic variables included in the model presented in row 2 are: (a) the unemployment rate and industrial production for Organization for Economic Co-operation and Development ("OECD") countries; (b) the Korean CRT glass producer price index ("PPI"); and (c) the quarterly LCD share of worldwide monitor revenue. The changes in the Korean glass PPI and the OECD industrial production represents the average quarterly percentage change (divided by a hundred) in that variable between quarters *t* and *t-x*, where *t* and *x* are defined according to Note #3 above. The changes in the OECD unemployment rate and LCD market share represent the average quarterly percentage point change in that variable between quarters *t* and *t-x*;
(7) The exchange rate used in row 3 represents the ratio for quarter *t* between the average price in the negotiated currency and the U.S. dollar average price (both weighted by sales volume) for a given model, factory, customer, and negotiated currency. The change in the exchange rate represents the percentage change (divided by a hundred) in the exchange rate between quarters *t* and *t-x*, where *t* and *x* are defined according to Note #3 above. The model presented in row 3 includes the change in the exchange rate and interactions between this variable and a series of seven "dummy" variables that take the value 1 if the currency in which the actual price was negotiated is the Deutsche Mark, Japanese Yen, South Korean Won, Malaysian Ringgit, Chinese Yuan, Taiwan New Dollar, or U.S. Dollar respectively, and zero otherwise. To avoid collinearity there is no dummy variable that equals 1 for prices negotiated in Brazil Real;
(8) I performed the following robustness checks on each of the regressions presented in the above table:
- weighting observations by sales volume;
- aggregating actual prices by group and quarter (or by group, currency, and quarter in the model presented in row 3);
- using clustered standard errors by group;

The range of results from these robustness checks are reported in the table;
(9) (***) indicates that the estimated coefficient is different from zero at the 0.1% significance level.

APPENDIX G: CHANGES IN CDT CAPACITY OVER TIME



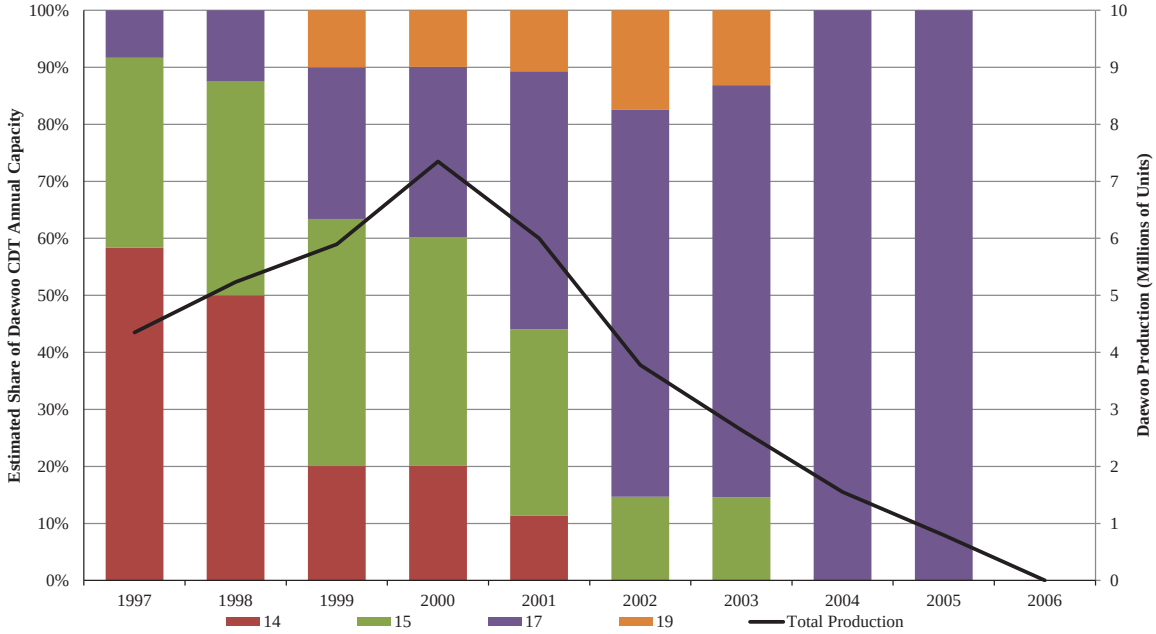
Note(s): Manufacturer production data for 2004Q1 unavailable. 2004Q1 production calculated as the average of 2003Q4 and 2004Q2 production.
Source data reports total CDT capacity by line and date. Capacity for a given size calculated as total capacity divided by number of sizes for given line and date.
CDT capacity identified by prefix "D:" in the "products" field from Dr. Netz's backup file "capacity_db_linetype.dta."
For a given date, capacity assumed to be zero if none reported.

Data Source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibits 2 and 82.

Source File(s): total production.do; total production.xlsx; HDP-CRT00019322_rough_translation.xls; SDCRT-0201291.dta; chu00071226.dta; mtpd-0416090.dta; vendor_map.do; vendor_map.xlsx; vendor_map_def.dta; vendor_map_name.dta; p004_pdn_mfg_shares_2006.do; t004_CDTpdn_tot_sdi_cpt_oec.dta; capacity_db_linetype.dta; CDT data.xlsx; p006_capacity_db_linetype_mfg_size.do; a006_capacity_db_linetype_mfg_size.xlsx

APPENDIX G: CHANGES IN CDT CAPACITY OVER TIME

Daewoo CDT Annual Production and Estimated Size Composition of Daewoo CDT Annual Capacity



Note(s): Manufacturer production data for 2004Q1 unavailable. 2004Q1 production calculated as the average of 2003Q4 and 2004Q2 production.
Source data reports total CDT capacity by line and date. Capacity for a given size calculated as total capacity divided by number of sizes for given line and date.
CDT capacity identified by prefix "D:" in the "products" field from Dr. Netz's backup file "capacity_db_linetype.dta."
For a given date, capacity assumed to be zero if none reported.

Data Source(s): Defendant data; see Expert Report of Janet S. Netz, April 15, 2014, Exhibits 2 and 82.

Source File(s): total production.do; total production.xlsx; HDP-CRT00019322_rough_translation.xls; SDCRT-0201291.dta; chu00071226.dta; mtpd-0416090.dta; vendor_map.do; vendor_map.xlsx; vendor_map_def.dta; vendor_map_name.dta; p004_pdn_mfg_shares_2006.do; t004_CDTpdn_tot_sdi_cpt_oec.dta; capacity_db_linetype.dta; CDT data.xlsx; p006_capacity_db_linetype_mfg_size.do; a006_capacity_db_linetype_mfg_size.xlsx

APPENDIX H: SUMMARY OF CDT OVERCHARGE MODELS

Regression Output for CDT Overcharge Models

Y = Log of average quarterly CDT price by size-manufacturer	(1) Netz Model	(2) Netz Model + 1995/96 Dummies	(3) Netz Model + 1995/96 Dummies + Addnl Controls
Cartel Dummy{=1 for 1995-2006}	0.250***		
	(0.0428)		
Cartel Dummy{=1 for 1995}		0.176***	0.176***
		(0.0406)	(0.0306)
Cartel Dummy{=1 for 1996}		0.193***	0.269***
		(0.0532)	(0.0368)
Cartel Dummy{=1 for 1997-2006}		-0.131	0.0176
		(0.0820)	(0.0625)
Cartel Dummy{=1 for 2007}	0.123**	-0.127	-0.0255
	(0.0560)	(0.0813)	(0.0522)
Log BOK glass PPI	-12.69***	-14.35***	-15.08***
	(4.290)	(5.024)	(5.405)
Log BOK glass PPI X tube size	1.573***	1.719***	1.735***
	(0.518)	(0.603)	(0.645)
Log BOK Glass PPI X tube size^2	-0.0435***	-0.0474**	-0.0476**
	(0.0154)	(0.0179)	(0.0191)
Log OECD GDP	2.127***	2.140***	0.966*
	(0.528)	(0.615)	(0.575)
OECD unemployment rate	-1.932***	-0.701	1.399
	(0.686)	(0.530)	(0.906)
OECD unemployment rate^2	0.149***	0.0507	-0.109
	(0.0511)	(0.0395)	(0.0698)
Revenue share of LCD monitors	-0.302	-0.460	0.573
	(0.338)	(0.311)	(0.372)
Revenue share of LCD monitors^2	0.694***	1.197***	-0.728*
	(0.224)	(0.249)	(0.368)
Log Won-USD exchange rate			-0.351***
			(0.0750)
Log shipping cost			0.0716***
			(0.0173)
Log worldwide desktop shipments			0.495***
			(0.119)
Log Korea labor cost			0.201
			(0.147)
Linear Trend	-0.0640***	-0.0338**	-0.0853***
	(0.0128)	(0.0164)	(0.0157)
Trend^2	0.000306**	-0.000295	0.000566**
	(0.000140)	(0.000200)	(0.000216)
Intercept	-1.781	-3.892	-11.11***
	(2.686)	(2.702)	(2.578)
Observations	1,114	1,114	1,112
R-squared	0.954	0.962	0.971

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
[1]

[1] See my backup file "Summary of CDT Overcharge Models.xlsx."

APPENDIX H: SUMMARY OF CDT OVERCHARGE MODELS

Notes:
(1) All specifications use the same data used by Dr. Netz for her overcharge regressions, i.e. data at the application-manufacturer-size level; We maintained the same error correction as Dr. Netz (clustering on the panel variable).
(2) All specifications use quantity weights.
(3) All specifications were estimated using the same control variables used by Dr. Netz: Bank of Korea glass PPI (also interacted with size and size squared), OECD GDP, unemployment and unemployment squared, revenue share of LCD monitors and its square, linear trend and linear trend squared.
(4) Specification (3) was estimated with the addition of the following 4 controls: Won-USD exchange rate, shipping cost index, worldwide desktop shipments, and Korean labor cost (all were converted to natural logs).
(5) Worldwide desktop shipments are based on IDC quarterly data for 1995 onwards. For 1993-4 the series is extrapolated using quarterly data on PC shipments from TAEC-CRT-00018123 and IDC Client PC Historical data_1995Q1 to 2013Q3.xlsx.
(6) Shipping costs are measured by the Baltic Dry Index, a composite index measuring the cost of moving the major raw materials by sea.
(7) Korean labor costs are measured by an indicator provided by the OECD which tracks Korean manufacturing unit labor costs.
(8) Korean exchange rate in Won per USD.

Sources: OECD stats website, IDC, Dr. Netz's report backup, Bloomberg LP, St. Louis Fed.

EXHIBIT 5

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NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

IN RE: CATHODE RAY TUBE (CRT) ANTITRUST LITIGATION	Master File No. CV-07-5944-SC MDL No. 1917
This Document Relates to: ALL INDIRECT-PURCHASER ACTIONS	

REBUTTAL EXPERT REPORT OF JANET S. NETZ, PH.D.

September 26, 2014

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I. Qualifications

I, Janet S. Netz, am a founding partner of applEcon, LLC. I have been a tenured Associate Professor of Economics at Purdue University and a Visiting Associate Professor at the University of Michigan. I received a B.A. (1986) from the University of California, Berkeley, *cum laude*, and an M.A. (1990) and Ph.D. (1992) from the University of Michigan, all in the field of economics. My doctoral fields were Industrial Organization, which is the study of firms and markets, the economic field most closely related to the issues in this case specifically and in antitrust generally, and International Trade, which includes the study of firms and markets in a global environment.

Among the courses that I have taught, those that are most closely related to the issues of this case include Industrial Organization at the undergraduate and doctoral level; Antitrust and Regulation at the undergraduate level; Microeconomic Theory at the undergraduate and master's level; and International Trade at the undergraduate and master's levels. I have guest lectured on the role of an economic expert in an Alternative Dispute Resolution class at the University of Michigan Law School. I have spoken on the role of economists and economics in class action antitrust cases at several American Bar Association conference programs. My research has focused on competitive interactions of firms and strategies firms can use to increase profits. I have published in peer-reviewed, scholarly journals and have presented my research at many conferences and seminars. A detailed account of my academic employment and publication histories is provided in my curriculum vitae, which is attached as Exhibit A.

I have testified in trial or by affidavit or declaration, especially with regard to the determination of the impact of anti-competitive conduct on consumers and quantifying the magnitude of the impact, for over ten years. In addition, I have consulted on numerous antitrust cases. I provide a list of the cases on which I have testified and consulted in my curriculum vitae, which is attached as Exhibit A.

I am compensated for my work on this case at the rate of $450 per hour. My compensation is not dependent on my opinions or the outcome of the case.

To the best of my ability, I kept track of the materials I reviewed. In Exhibits B and C, I provide a list of all confidential and public documents, respectively, that my staff and I have reviewed since my Merits Report was filed April 15, 2014. See Exhibits B and C of my Merits Report for additional documents reviewed. I reserve the right to revise my conclusions and opinions as more information comes to light.

II. Assignment

Based on my review of the case facts and evidence, in my merits report I concluded that the CRT cartel engaged in a variety of anti-competitive conduct that allowed it to increase the price of CRTs above the competitive level. I concluded that the overcharge imposed by Defendants on direct purchasers was subsequently passed down the distribution channel to class members (end users). I then developed common methods based on common evidence to calculate a reasonable

estimate of the overcharge imposed on direct purchasers and the ultimate damages suffered by class members. I concluded that the cartel harmed class members by $2.8 billion dollars.[1]

For this report, I have been asked by counsel for the Indirect Purchaser Plaintiffs to evaluate the case facts and economic analyses presented by Defendants' experts, to consider the conclusions reached by these experts, and to determine if any new information has changed the conclusions expressed in my merits report.

III. The relevant economic framework to answer the questions at issue

To engage in and understand the appropriate economic analysis, it is important to keep in mind the appropriate economic framework. The questions at issue, broadly, are (1) to evaluate whether the cartel's conduct increased the price of CRTs and (2) if so, to quantify that harm.

A. To evaluate and quantify the impact of the CRT cartel, one should compare the observed outcome given a CRT cartel to the but-for world in which Defendants would not have colluded

Because the but-for world – the world where Defendants did not engage in the allegedly anticompetitive conduct, but instead made business decisions independently – cannot be observed, simply because that world did not occur, one must draw inferences based on observed conduct from other time periods or from other industries or markets not subject to the conduct at issue.

For any comparison put forward to support a claim that the cartel is effective or ineffective, one should consider whether the comparison is appropriate. In particular, Defendants' experts at times compare variables that change over time, but only within the period that was subject to the alleged cartel.[2] If no argument is made that the cartel did not operate at some time period used in the comparison, the comparison cannot support a finding regarding the effectiveness of the cartel.

---

[1] My conclusions are set out in Section V of the merits report, while the remainder of the report puts forth the factual evidence and economic analyses that underlie these conclusions. Netz, Janet S., 15 April 2014, Expert Report of Janet S. Netz, Ph.D, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Netz Merits Report"). My estimate of damages was reported in Netz, Janet S., 03 July 2014, Errata to the Expert Report of Janet Netz, Ph.D, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Netz Merits Errata").

[2] See, e.g.,

- Willig, Robert D., 05 August 2014, Expert Report of Robert D. Willig, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Willig Opposition Report"), at ¶66.
- Guerin-Calvert, Margret E., 05 August 2014, Expert Report of Margret E. Guerin-Calvert, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Guerin-Calvert Opposition Report"), at ¶¶87-98.
- Rubinfeld, Daniel L., 05 August 2014, Expert Report of Daniel L. Rubinfeld, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Rubinfeld Opposition Report"), at ¶¶59-60.

B. To make the above comparison, one should hold "all else equal"; that is, the proxy for the but-for world should differ from the actual world only in terms of Defendants' conduct

The question at issue is conceptually simple: what would have happened to prices for CRTs and CRT products if the world were just like it was except for one change – that the Defendants competed with each other, rather than colluding?

While the question is conceptually simple, that is not to say that finding the answer to the question is simple. The complexity is caused by the fact that the but-for world is not observed and must be inferred from proxies (different time periods or industries that were not subject to the allegedly anticompetitive conduct), and by the fact that any economic outcome is subject to a variety of influences.

For any comparison put forward to support a claim that the cartel is effective or ineffective, one should also consider whether all other influences remain the same – different prices for different products, different bargaining abilities, demand levels, cost levels, etc. If not, care must be taken to account for these other changes.

IV. Summary of conclusions: Defendants' experts' analyses are flawed or irrelevant

Plaintiffs alleged that Defendants' engaged in a pattern of activity to fix the price of CRTs from approximately 1995 to 2007. As part of evaluating the impact of this conduct, I examined a variety of evidence related to the Defendants' conduct. I found voluminous evidence that the Defendants had developed a hierarchical structure of meetings among executives that occurred on a frequent basis; developed a web of other types of communication, including bilateral meetings, e-mails, and phone calls; came to agreements to set particular prices; came to agreements to reduce capacity and production on short-term and long-term bases; and monitored or audited cartel participants' prices, capacity, and production.

In my merits report I considered whether a cartel that engaged in this conduct in the CRT industry would have the market power that would enable it to raise price above the competitive level. I found that there were barriers to entry, a necessity for a cartel to raise price. I also found that the competitive influence of LCD products on CRT prices was not sufficient to prevent the cartel from raising the price of CRTs. Defendants' experts do not dispute these points.[3] Ms. Guerin-Calvert, Prof. Willig, Prof. Ordover, and Dean Snyder discuss a variety of other industry characteristics that they assert make it "more difficult" or "less likely" for the cartel to operate successfully. None of these characteristics marks an insurmountable burden to a successful cartel; the economic literature has ambiguous predictions as to whether some of these characteristics hinder or actually facilitate a cartel; and there are real-world cartels that have many of these characteristics.

Defendants' experts consider several types of Defendants' conduct that the experts use to support conclusions that the cartel would not have succeeded in raising the price of all CRTs, that some activity may not be anticompetitive, or that the cartel was generally unsuccessful. In fact, the

[3] Defendants' experts do conclude that the introduction and growth of LCD products limited the extent to which the cartel could raise the price of CRTs above the competitive level, as I also concluded in my merits report. Netz Merits Report, p. 14.

cartel had the incentive and ability to increase the price of all CRTs, including large size CPTs and CRTs consumed in North America. Defendants' experts actually explain why the cartel would raise the price of all CRTs, although they reach a different conclusion. If the cartel attempted to increase the price of only some CRTs, then consumers would substitute away from those CRTs, limiting the cartel's ability to raise prices. Defendants' experts then argue that these shifts in demand would cause the cartel to be ineffective. While I agree with the potential problem, the answer for the cartel is to raise the price of all CRTs.

Defendants' experts also assert that a high degree of product differentiation will make it difficult for the cartel to reach agreement. I find product differentiation is not nearly as pervasive as Defendants' experts claim. In fact, sales are quite concentrated on a small number of different CRTs. I also show that a handful of product characteristics explain almost all of the variation in CDT and CPT prices. This means that Defendants did not need to set target prices for each type of CRT. There is evidence to show that Defendants understood the value relationship between CRTs and set prices accordingly.

Defendants' experts suggest that information exchanges between cartel members were not necessarily anticompetitive. While information exchanges in general may not be anticompetitive, the characteristics of the information exchanges undertaken by the CRT cartel members had the attributes that indicate an anticompetitive impact: the firms were exchanging current and future plans, the information was firm-specific, and the firms were exchanging information directly with each other. Furthermore, the effect of the information exchanges must be considered in light of the accompanying conduct. That is, information exchanges were but one part of a comprehensive set of activities designed to result in CRT prices that were higher than the competitive level. In addition, documentary evidence indicates that the information exchanges had anticompetitive effects. That the information exchanges were not anticompetitive is not a tenable conclusion when the case is examined as a whole.

Defendants' experts emphasize the evidence of "cheating"; that is, documents and communications that indicate that some Defendants were unhappy with other Defendants, that some Defendants were charging prices that were lower than agreed. While Defendants' experts are correct that members of a cartel have an incentive to cheat, undercutting the price of other cartel members, resulting in increased sales and profits for the cheater, they are incorrect that discussion of cheating indicates widespread ineffectiveness. Economic theory and empirical studies in the past twenty years have established that cartel effectiveness is compatible with the existence of cheating. That this is the situation in the CRT cartel is supported by the fact that cartel members engaged in these activities for a thirteen year period. Given the substantial penalties for price fixing, both in terms of fines to the firms and jail times for executives, we would not observe continued participation if the cartel was not sufficiently effective to offset the risk the firm and the managers were taking.

In addition to applying economic principles to the conduct of the cartel given the industry facts, I also examined some empirical evidence to evaluate the impact of the cartel. In my merits report, I presented an analysis showing that the cartel's target prices increased the price of CRTs that had target prices and that did not. The analysis controlled for market determinants of supply, and included a lagged dependent variable to prevent a statistical problem called spurious correlation. Defendant' experts criticized my analysis of the impact of target prices on actual prices and implement their own empirical analysis. Ms. Guerin-Calvert and Prof. Willig find the same thing that I did – target prices cause higher actual prices for CRTs that have target prices and those that

do not. Dean Snyder misinterprets his target price regression results. They actually show that the cartel had the same impact on prices of targeted and non-targeted CRTs.

Defendants' experts also present other empirical evidence that they interpret as evidence that the cartel was not effective. They make two logical errors in their analyses and interpretation: they do not make the right comparison and they do not hold "all else equal". A cartel succeeds when it raises actual price above the but-for price (the price that would hold if the cartel did not exist). The proper comparison is between an outcome in the actual world and a proxy for the outcome in the but-for world. Defendants' experts' comparisons often simply involve changes in variables over time. Unless there are observations before or after the cartel, such an analysis is not evidence that the cartel was successful (or not). In addition, virtually all economic predictions are subject to the caveat "all else equal". For example, since a cartel raises price by limiting the quantity produced, one would expect production to fall when a cartel forms, *if nothing else changes* (that is, all else equal). If a cartel forms and demand expands, then an observation that production increased is not informative as to the success of the cartel, without in some way accounting for the increase in demand. Defendants' experts' empirical evidence suffer from one or both of these flaws, and is consistent with the existence of a successful cartel.

The claims made by Defendants' experts do not change my conclusion that 22.0% and 9.0% are reasonable measures of the direct overcharge imposed on CDTs and CPTs, respectively, for most of the cartel period.[4] Defendants' arguments are based on incomplete analyses of the case evidence, incomplete and misleading summaries of my methods and reasoning, application of their own variations to the model on subsets of the data, and attempts to measure impacts other than that for which I developed the overcharge model. Case evidence supports cartel overcharges throughout 1995-2007, including 1995 and 1996. Ms. Guerin-Calvert and Prof. Willig overlook the documentary and testimonial evidence related to cartel conduct and effectiveness in 1995 and 1996. Case evidence also supports overcharges for large CPTs and for CPTs sold directly to North America and Hitachi's and Panasonic's participation in the cartel. My overcharge model is robust to small changes in the model, contrary to Defendants' experts' claim. Defendants' experts ignore the sensitivity analyses I reported in my merits report.[5] Defendants' experts propose a number of alternative measures of demand and supply. Adding these control variables results in statistically and economically significant overcharges. In addition, the proxy variables Defendants' experts suggest do not explain materially more of CRT prices changes than the variables I use. My model is based on an analysis of all the data available, while Defendants' experts apply the model to small subsets of the data. It is no wonder that Defendants' experts results are variable and at odds with the facts.

Ms. Guerin-Calvert, Prof. Willig, and Dr. Wu purport to calculate profit margins in the but-for world using my overcharge calculations. Their calculations use accounting margins, despite the well-known fact that accounting margins are not reasonable proxies for economic margin and require strong, unstated, implausible assumptions to conclude that the results of their calculations are, as Ms. Guerin-Calvert claims, what "margins would have been in the `but-for' world".[6] Because their margins do not measure what they purport to, they do not support the conclusions

[4] Netz Merits Errata.

[5] Netz Merits Report, Exhibit 65.

[6] Guerin-Calvert Opposition Report, at ¶133.

of Defendants' experts that the margins are evidence that the results of my overcharge model are implausible. In fact, the results of my overcharge model are consistent with an accurate consideration of the margin data.

Contrary to Prof. Ordover's claims, my pass-through analysis is completely consistent with economic theory and empirical studies. Economic theory establishes that pass-through of an industry-wide cartel overcharge is positive. Economic theory and empirical studies also establish that pass-through can be greater than, equal to, or less than 100%. Any characteristics that move an industry farther from the textbook description of perfect competition push the pass-through rate away from 100%, but whether it becomes smaller or larger depends on the demand for the product. None of these characteristics preclude pass-through. Testimonial evidence cited by Prof. Ordover and Prof. Rubinfeld are consistent with the economic predictions that price depends on not only cost, but also other supply, demand, and competition properties. The testimony is not useful in answering the question at issue – how does price change if cost increases, *all else equal*. To answer that question, I conduct 63 statistical studies. The results are consistent: an overcharge is completely passed on to end-users; that is, end users suffer at least the full extent of the overcharge.

Finally, Prof. Ordover suggests that a portion of the volume of commerce I use in my calculation of damages is legally unsupported under the Federal Trade and Antitrust Improvements Acts. I leave that legal question to the court; my calculation of damages can be adjusted to remove or add to the volume of commerce as requested by the court. At this point I stand by my calculation of $2.8 billion as an economically reasonable lower bound of the harm done to class members.

V. Defendants' conduct is consistent with an effective cartel

A. Plaintiffs' allegations about Defendants' pattern of conduct is supported by the record

Plaintiffs' lay out their allegations in the complaint.[7] I summarized the allegations in my merits report and then described the conduct in detail in my analysis of the effects of the cartel.[8] Briefly, the cartel implemented the conspiracy to increase price with a variety of conduct, including: setting up a four-level hierarchy of multi-lateral meetings; met frequently; engaging in bilateral meetings and communications; setting target prices; setting price differentials for different types of CRTs; agreeing to reduce output or capacity below the competitive level; monitoring each other's prices, output, and capacity; fixing market shares; allocated customers; exchanging sensitive information that is not normally shared with competitors.

Plaintiffs allege a single conspiracy to raise the prices of both CDTs and CPTs. The following facts are consistent with a single conspiracy:

- The same Defendants manufactured both CDTs and CPTs and attempted to collusively raise the price of both types of CRTs.

[7] 10 January 2013, Indirect Purchaser Plaintiffs' Fourth Consolidated Amended Complaint, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Complaint").

[8] Netz Merits Report, at 2-4, 41-62, and Exhibits 1, 27, 28, 29, 39.

- Many of the same employees are alleged to have been involved in efforts to collusively raise the price of both CDTs and CPTs.
- Defendants used similar methods in their attempt to raise the prices of both CDTs and CPTS.
- CDTs and CPTs are, to some degree, supply substitutes – manufacturing capacity can, in some cases, be converted from producing CDTs to CPTs and vice versa.

There are, however, differences between the markets for CDTs and CPTs. For one, they are not demand substitutes and the demand conditions in the CDT and CPT markets differed. Economic theory predicts that a profit-maximizing cartel would determine the prices of CDTs and CPTs separately. This suggests that it's possible that the impact of Defendants' conduct on CDT prices could have differed from the impact on CPT prices. Accordingly, I analyze the two separately when assessing the impact of Defendants' conduct and when estimating overcharges.

While I have assumed that plaintiffs will prove liability, I have examined evidence regarding the operations of the cartel in order to evaluate the impact of the cartel. Some of this evidence has been laid out in my class certification report, my class certification rebuttal, and my merits report. Defendants' experts have made a variety of claims in their opposition reports regarding the supposed lack of evidence regarding the scope of the cartel and its conduct. I have engaged in additional examination of the evidence to evaluate these claims and found that Defendants' experts' claims are unfounded.

1. Target prices are useful for quantitative analysis of the cartel

Defendants' experts often seem to indicate that the cartel consisted solely of setting target prices for a subset of CRTs, or at least focus much of their attention to target price evidence. While the target prices are the most easily quantifiable of the cartel's activities and therefore lend themselves to empirical analyses, they are only a subset of the conduct. In their depositions, Prof. Willig, Dean Snyder and Prof. Rubinfeld acknowledged that I rely on more than target pricing.[9]

Target prices were not the only tool the cartel used to raise prices above the competitive level. As explained in my previous report, Defendants also imposed output and capacity restrictions, shared information and plans, allocated customers, and employed most-favored customer clauses.[10] Much of my quantitative analysis uses target prices. This is not because target prices were the only, or even most effective, tool that Defendants employed in their efforts to raise prices. I analyze target prices because they are more easily quantified than other types of collusive conduct and thus can be used for statistical analysis.

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[9] See,

- 19 September 2014, Deposition of Robert Willig, Ph.D (Hereinafter "Deposition of Robert Willig, 19 September 2014"), at 150:25-151:12.
- 11 September 2014, Deposition of Edward Snyder, Ph.D (Hereinafter "Deposition of Edward Snyder, 11 September 2014"), at 232:24-235:8.
- 08 September 2014, Videotaped Deposition of Daniel L. Rubinfeld, Ph.D (Hereinafter "Deposition of Daniel Rubinfeld, 08 September 2014"), at 103:18-23.

[10] Netz Merits Report, at Section VIII.A.3.

The fact that I have not found more target prices is not evidence that Defendants set price competitively or that there were time periods when or CRTs on which the Defendants were not imposing an overcharge. Defendants had strong incentives to hide their collusive activity from their customers and law enforcement.[11] Defendants likely did not document all target prices or the documentation may have been destroyed. In addition, several of the firms that participated in the cartel are no longer in existence. In some cases documents may have been passed to a successor, but not always. For these reasons, it is not surprising that I have identified relatively few price targets for 1995 and 1996.

One must also keep in mind that price-fixing is illegal, many Defendants were aware of this, and made efforts to conceal the collusion. Economists have noted this issue with respect to scholarly analyses.[12] As such, there is no reason to expect that the evidence that has been uncovered is complete. Finally, millions of pages of documents have been produced, many or even most in languages other than English and many as handwritten notes, and identifying all meeting notes that resulted in an agreement to fix price is necessarily incomplete.

Defendants' experts agree that I did not identify all target prices set by Defendants.[13]

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[11] See, e.g.,

- Netz Merits Report Section VIII.A.4.a.
- 17 September 2014, Deposition of Margaret Guerin-Calvert (Hereinafter "Deposition of Margaret Guerin-Calvert, 17 September 2014"), at 160:17-161:7.
- Deposition of Robert Willig, 19 September 2014, at 35:20-36:5.

[12] See, e.g.,

- "Of course, these estimates of cartel duration must be treated with caution, as they are not based on random samples. To the contrary, because cartels are often secretive and even illegal, sample selection reflects the legal regime in which the cartels operated. In some cases, samples are literally selected by prosecutors; in such cases we simply do not know whether cartels that run afoul of legal authorities are similar to or different from cartels that manage to escape unnoticed." Levenstein, Margaret C. and Valerie Y. Suslow, 2006, What Determines Cartel Success?, Journal of Economic Literature, Vol. XLIV, 43-95, at p. 44.
- "A number of problems related to any [cartel] data set like this have to be mentioned. This data set includes overcharges associated with cartels that: (a) have revealed themselves or have been uncovered; (b) information on which has been published; and (c) cases that have been selected by the author to be included in his data set. Therefore, the data set does not include overcharges of: (a) cartels that have never revealed themselves; (b) cartels that have become known but their information has never become publicly available; and (c) cartels that have not been selected by the author. We are not aware of the exact number of uncovered cartels. There are estimates suggesting that only 13–17 percent of illegal cartels are caught. Consequently, approximately 80 percent of such cartels are not known." Bolotova, Yuliya, Connor, John M., et al., 28 August 2008, Factors Influencing the Magnitude of Cartel Overcharges: An Empirical Analysis of the U.S. Market, Journal of Competition Law & Economics, 5(2) 361 – 381, at pp. 366 – 367.

[13] See, e.g.,

- Deposition of Edward Snyder, 11 September 2014, at 197:9 - 197:13.
- 15 September 2014, Deposition of Darrell Williams, Ph.D (Hereinafter "Deposition of Darrell Williams, 15 September 2014"), at 24:17 - 24:25, 46:9 - 46:24, and 263:12 - 263:15.
- Deposition of Margaret Guerin-Calvert, 17 September 2014, at 162:5 - 163:5.
- Deposition of Robert Willig, 19 September 2014, at 162:7 - 163:14.

2. Target prices apply to many CRTs sold

There is considerable evidence that all Defendants engaged in collusive behavior,[14] that the cartel sought to raise prices for all types of CPTs and CDTs,[15] that this collusive behavior started in 1995 and only ended in 2007,[16] and that the collusive behavior took place in North America as well as Asia.[17] It does not make sense for the cartel to raise the price of some CPTs or CDTs but not others.[18] Defendants' expert have not provided any explanation as to why they think Defendants would attempt to raise the price of some CRTs while pricing other CRTs competitively; in fact, Defendants' experts discussion of this possibility shows why the cartel would increase the price of all CRTs; see Section V.D.

Consistent with this evidence that Defendants' collusion was long-lived and applied to substantially all CRTs, I have identified target prices that matched 39.0% of sales of CDTs and 29.7% of CPTs.[19] This is equivalent to $13.2 billion of CDT sales and $8.8 billion of CPT sales.[20]

Several of Defendants' experts claim that there are few target prices matched with certain types of sales. For example, they cite low coverage for sales by a particular Defendant, for sales of certain types or sizes of CRTs, for sales during a particular time period or for sales to customers in North America.[21] As I explained in Section IV, Defendants did not rely solely on target prices in their effort to raise prices.

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[14] Evidence is cited generally throughout my class certification, class rebuttal, and merits reports. In particular, see Netz Merits Exhibit 27; Target price-structure.xlsx in my backup materials; and Exhibits RR-85-RR-88. All exhibits for Netz Merit Rebuttal begin with the prefix RR. Updated exhibits from Netz Merit Report retain the same exhibit number as the old report. New exhibits are numbered sequentially starting from the last exhibit number in the Netz Merits Report. Therefore, exhibit numbers in this report may not be in sequential order. RR-62, RR-63, RR-71, RR-73, RR-75, and RR-76 were updated from Netz Merits Report. RR-85 through RR-99 are new exhibits.

[15] See, e.g.,

- Section IV.
- Section V.D.
- Netz Merits Report, at Section VIII.A.4.b.

[16] See, e.g.,

- Section IV.
- Netz Merits Report, at Sections VIII.A.3.a and XI.B.

[17] See Section VI.A.5.

[18] See,

- Section V.D.
- Netz Merits Report, at Section VIII.A.4.b

[19] Netz Merits Report, at Section VIII.A.4.a.

[20] See combine_target_defendant_revenues.log in my Backup files.

[21] See, e.g.,

- Williams Opposition Report, at ¶¶47-54, 108-114, and 144-145.

Because target prices were not the only tool Defendants used to increase prices, there may be some CRTs for which there exist no target prices because Defendants sought to increase their prices using other tools (e.g., line shutdowns). And in Section V.D.1 I explain that the cartel did not need to set target prices for all products because the prices of CDTs and CPTs are tightly related to their product characteristics (e.g., size and finish) via a price structure.

For these reasons, there are almost certainly target prices that I have not seen and my analysis of target price "coverage" likely understates the true amount of Defendants' sales that were covered by target prices.

3. Target price matching methodology

Prof. Willig and Ms. Guerin-Calvert claim that my method of matching target prices with the prices in Defendant sales data overstates the true level of target price coverage and propose three changes to my calculations. All of these changes are misguided, although only one of them makes a meaningful change in share of Defendants' sales that are covered by target prices.

Defendants' experts assumed that a target price is only effective during the month in which it was to take effect. I treated a target price as effective for the entire calendar quarter because target prices were generally determined quarterly and the terms of actual sale prices were typically negotiated quarterly. The only adjustment made by Prof. Willig and Ms. Guerin-Calvert that has a substantial impact on the calculation of target price coverage is their choice to match target prices with actual prices on a monthly—rather than quarterly—basis.[22]

Defendant documents and testimony indicate that CRT prices, both actual and target, were often set on a quarterly basis. Almost 70 meeting notes documents ranging from September 1996 to September 2006 contain quarterly target prices; see Exhibit RR-89. Cartel discussions also support the presumption of quarterly pricing.[23] Furthermore, several deponents have testified that

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- 05 August 2014, Opposition Expert Report of Lawrence Wu, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Wu Opposition Report"), at ¶¶83-84.
- Willig Opposition Report, at ¶¶32-34, and 96.
- Guerin-Calvert Opposition Report, at ¶¶66-69.

[22] Adjusting only the timing of matching (quarterly vs. monthly) decreases coverage from 39.0% to 19.0% for CDTs and from 29.7% to 19.7% for CPTs. Maintaining quarterly matching but making the other adjustments proposed by Defendants' experts decreases coverage from 39.0% to 34.8% for CDTs and from 29.7% to 26.3% for CPTs. See combine_target_defendant_timing.log and combine_target_defendant_shape_participants.log in my Backup files.

[23] See, e.g.,

- "It was also agreed that at the next meeting to review the prices for each quarter of Year 2000." Chunghwa Picture Tubes, LTD, 21 September 1999, Visitation Report, CHU00029175 - CHU00029178, at 9178.01E.
- "It appears that the price of glass went up 3-4%, and it looks like all companies are asking for price increases on CPT every three months." Watanabe, Genichi, 30 March 2000, E-mail, Subject: Other company CDT status - Internal use only, HDP-CRT00025985, at 5985.
- "It is very important to set the price for the next three months to stabilize the market and inventory." 11 May 2001, Report of Color CRT Industry Meeting, SDCRT-0087694 - SDCRT-0087698, at 2.
- "(1) Prices to be established quarterly [bullet] Only one offer for each quarter (qty + price) [bullet] No spot deal or special price [break] (2) Prices agreed (for each quarter) at least one month before through matrix

their companies negotiated CRT prices with customers on a quarterly basis.[24] Testimony from at least one finished goods producer likewise supports this.[25]

Prof. Willig and Ms. Guerin-Calvert also reject my practice of applying certain target prices to all Defendants even if they weren't at that particular price-fixing meeting.[26] This adjustment has

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system -> qty/customer/type". Samsung SDI, 21 November 2003, Schiphol Meeting, SDCRT-0088635 - SDCRT-00886660, at 8640.

- "14" price increase is continuing (the price increase amount is decided every three months at the meeting)." MT Picture Display, 18 June 2004, ASEAN MTG (Small and Mid-Sized Units), MTPD-0493552 - MTPD-0493554, at 3552.

[24] See, e.g.,

- Panasonic/MTPD: "[Sales were] mainly for existing customers. Normally, we would receive the price request from a customer, and the prices -- price was determined, more or less, every three months or on a quarterly basis. Before the one quarter, about one to two months prior to that, the -- there was a price negotiation. When the -- the agreement was reached about the price, then we would get the purchase order from the customer." 17 July 2012, Deposition of Panasonic Corporation, Panasonic North America and MTPD 30(b)(6) Witness Hirokazu Nishiyama, Volume I (Hereinafter "Panasonic 30(b)(6) Deposition of Hirokazu Nishiyama, Vol. I, 17 July 2012"), at 65:24 - 66:6.
- LPD: "The -- the process was that each of the markets, each of the regions were doing their own conversations with -- with their customers, their own base of quarterly contracts, etc." 18 December 2013, Deposition of Wiebo Jan Vaartjes, Volume I (Hereinafter "Deposition of Wiebo Jan Vaartjes, 18 December 2013") at 114:25 - 115:4.
- Samsung: "And thirdly, based on the quarterly pricing -- most people are, based on their experience, they're aware of what their pricing should be for that quarter. They just know it intuitively because of their experience. So if the price is like five percent lower than the pricing for that quarter, then the employee would know that it's too excessive. In that case, the employee would turn to the headquarters and have a discussion." 07 June 2012, Deposition of Samsung SDI 30(b)(6) Witness Jaein Lee, Volume II (Hereinafter "Samsung SDI 30(b)(6) Deposition of Jaein Lee, Vol. II, 07 June 2012") at 188:24 - 189:8.
- LG: "So at the time the internal transaction prices for CRT from the CRT business unit to the set business unit were supposed to be adjusted quarterly. Either they were changed or they were extended. And that prices were set at the 95 percent of the average prices charged to the products sold outside of LG, which is not the internal prices which were charged in the previous quarter." 09 July 2012, Deposition of LG Electronics 30(b)(6) Witness Mok Hyeon Seong (Hereinafter "LG 30(b)(6) Deposition of Mok Hyeon Seong, 09 July 2012"), at 77:19 - 78:2.
- Toshiba: "Q. And how often would you meet with the team at Compaq? A. Quarterly. Q. In Houston? A. In Houston, for the most part. Q. And talk about the same things, pricing of Toshiba tubes and trying to get them to use Toshiba tubes in their monitors? A. Yes." 28 January 2014, Deposition of Daniel Patrick Ryan, Volume I (Hereinafter "Deposition of Daniel Ryan, Vol. I, 28 January 2014"), at 70:16 - 70:24.

[redacted]

[25] "Q. How frequently did you negotiate prices with LGE's CRT suppliers? A. Basically it was once per quarter." 16 January 2014, Deposition of Duk Chul Ryu, Volume II (Hereinafter "Deposition of Duk Chul Ryu, 16 January 2014"), at 237:24 - 238:1.

a very minor effect on the target price coverage results.[27] However, there is substantial evidence that decisions made at cartel meetings were communicated to CRT manufacturers that did not attend those meetings, making it entirely appropriate to apply target prices across all Defendants for the purpose of my coverage analyses. Defendant testimony is clear that Defendants relied on a network of communication between meeting attendees and non-attendees.[28] The meetings notes are similarly full of references to this interconnectedness. See Exhibit RR-90.

[26] If two or more manufacturers agreed to the same price for the same customer and the same CRT characteristics without a conflicting target price from any other manufacturer, then I applied that target price to all manufacturers.

[27] Coverage decreases from 39.0% to 35.3% for CDTs and 29.7% to 28.2% for CPTs. See combine_target_defendant_participants.log in my Backup files.

[28] See, e.g.,



Defendant sales data sometimes (but not always) include information on the shape of the tube being sold. Likewise, meeting notes sometimes (but not always) include information on the shape of the tube for which a target price is set.

As I explained in my Merits Report,[29] I do not incorporate shape when matching target prices with sales data because most of the data fail to identify tube shape. Defendants' experts attempt to use the limited information available on tube shape when matching target and actual prices, although their methods for doing so vary. The negligible effect that the inclusion of a shape variable has on coverage indicates that my approach was appropriate.[30]

4. Defendants' experts' claims of limited evidence of collusion are contradicted by the evidence

Defendants' experts assert a paucity of data for some particular slice of the cartel such as the early years or for a particular Defendant or subset of CRTs. Their assertions are contradicted by the evidence.

[redacted]

Jae In Lee, who held various marketing positions for CRTs for Samsung:

- "Q. Okay. And you have a recollection that on occasion you met with individual competitors outside the context of the glass meetings, or the GSM meetings; correct? A. That is my recollection. Q. All right. And that occurred periodically between 1998 and 2004; correct? [objections omitted] THE WITNESS: I don't believe they occurred periodically, but I believe we contacted each other, if necessary, and had meetings. BY MR. SHAPIRO: Q. Okay. And you had meetings with representatives from Toshiba, didn't you? [objection omitted] THE WITNESS: I don't have an exact recollection as to when and how I got to meet with them, but I do recall as to meeting with them." 24 July 2013, Deposition of Jae In Lee, Volume I (Hereinafter, "Deposition of Jae In Lee, Vol. I, 24 July 2013"), at 48:22 – 49:16.
- "Q. Do you recall that your company, from time to time when you attended glass meetings, was requested to contact a Japanese CDT manufacturer to fill them in on what was discussed at glass meetings? ... THE WITNESS: What I'm saying is that I have heard a discussion as to let us let the Japanese manufacturers know of these facts." Deposition of Jae In Lee, Vol. I, 24 July 2013, at 82:23 - 83:19.
- "[Q.] What I'm asking you is: Do you have a general recollection of during the time period that you attended glass meetings, that Samsung was assigned a particular Japanese CDT manufacturer or particular Japanese CDT manufacturers to go talk to and let them know what was discussed and agreed to at the glass meeting? [objections omitted] THE WITNESS: As I said before, there were that kind of discussions." Deposition of Jae In Lee, Vol. I, 24 July 2013, at 127:23 - 128:9.

[29] Netz Merits Report, at footnote 203.

[30] Adding a shape variable reduces CDT coverage from 39.0% to 38.5% and CPT coverage from 29.7% to 27.7%. See combine_target_defendant_shape.log in my Backup files.

Ms. Guerin-Calvert inaccurately claims that plaintiffs allege that there was greater collusive activity during 1997-2006 than in 1995-1996.[31] Prof. Willig notes that there were no target prices for CPTs in 1995-1996 and the earliest agreement to limit CPT production or capacity was September 1998.[32] In addition to the evidence cited in my merits report, I have documented additional evidence regarding collusive activity in 1995-1996 in Exhibit RR-85.

Dr. Williams asserted that Panasonic did not participate in multi-party meetings and that I identified only a handful of other meetings.[33] Dr. Williams ignores the fact that there are many other ways Panasonic participated in the cartel. I cited to some of that evidence in my merits report and I have documented additional evidence as well in Exhibit RR-86**.**

Dean Snyder claims that I have not identified much evidence of cartel behavior for Toshiba.[34] I cited to some of that evidence in my merits report and I have documented additional evidence as well in Exhibit RR-87.

Prof. Willig says that target prices were less common for larger CPTs.[35] Again, target prices were not the only collusive conduct in which the cartel engaged. I cited to some of that evidence in my merits report and I have documented additional evidence as well, see Exhibit RR-91.

Dr. Wu claims that I have not identified much evidence of cartel behavior with respect to KPNV, the holding company for Philips. In addition to the evidence cited in my merits report, I have documented additional evidence as well.[36]

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[31] Guerin-Calvert Opposition Report, at 5.

[32] Willig Opposition Report, ¶75.

[33] Williams Opposition Report, ¶45, ¶56, and Exhibits 8A.

[34] Snyder, Edward A., 05 August 2014, Expert Report of Edward A. Snyder, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Snyder Opposition Report"), ¶¶142-159; Deposition of Edward Snyder, 11 September 2014, at 69:8 - 69:16.

[35] Willig Opposition Report, footnote 44.

[36] See, e.g.,

- David Chang, who participated in early cartel meetings and even came up with the 3-level meeting structure, was a Philips representative on LPD's Supervisory Board. For role in conspiracy meetings, see 19 February 2013, Deposition of Chih Chun-Liu, Volume I, at 48:4 - 48:12, 366:18 - 367:12. For role as member of the Supervisory Board (SVB), see LG Philips Displays, 04 July 2003, Information on Legal Entities of LG.Philips Displays, LPD-NL00202015 - LPD-NL00202022, at 2015.
- LPD employees had meetings with Matsushita and Toshiba and discussed the CRT, LCD, and PDP business. This information was forwarded to a Philips employee. Leborgne, Guy, 17 June 2002, Email: Competitors info, PHLP-CRT-052964 - PHLP-CRT-052965, at 2964.
- From an internal Philips e-mail written by an LPD Supervisory Board member: "During the shareholders meeting Andreas Wente showed the strategic outlook for LPD, and we asked him and his team to become more aggressive in sales, pushing out competitors (who must be bleeding even more than we are). However, most small competitors have been visited and did not show interest to close their factories earlier than ours (except Thomson USA, which will close at least 2 lines)." Spaargaren, Frans, 15 July 2003, Email: Brief update on LG.Philips board meetings and shareholder meetings, PHLP-CRT-053164 - PHLP-CRT-053165, at 3164.

Finally, Dr. Howell mischaracterizes my evaluation of the cartel's impact on Defendants' prices; she assumes that my evaluation of impact relies solely on the estimate of classwide damages.[37] In fact, I concluded my evaluation of impact before I estimated damages.[38] I cited to a variety of evidence specifically involving Hitachi in my merits report; I have documented additional evidence in Exhibit RR-88.

B. Defendants would not have continued to participate in the cartel unless the benefits outweighed the costs

In my previous report, I explained that Defendants' participation in the cartel was costly and carried significant legal risk in the form of fines and jail time for those involved.[39] Defendants' conduct made no sense unless the cartel was able to raise prices far enough above the competitive level to offset these costs.

Prof. Willig agrees that it would be irrational to engage in the alleged conduct unless the expected benefits outweighed the expected costs.[40] Nevertheless, he suggests that the benefits of cartel participation could outweigh the costs even if the cartel only achieved "sporadic, temporary, small increases in some CPT prices above but-for levels".[41] Prof. Willig does not assess the magnitude of the costs of cartel participation and thus has no basis for concluding that sporadic, temporary, small increases in some CPT prices would sufficiently outweigh the costs of cartel participation.

To date, cartel members have been fined at least $2.04 billion in fines to four governments[42] and $114 million to settle civil claims.[43] In addition, six executives have been indicted on anti-

- From a Philips purchasing e-mail: "As you know there is a glass meeting for CDT suppliers and they have agreement to well manage CDT price especially for major 17" CDT even reduce thier [sic] production capacity." De Lombaerde, Jan, 08 October 2004, Re: RoFo Savings for AOP 2005, PHLP-CRT-149827 - PHLP-CRT-149830, at 9828.
- "Parents companies want LPD to suggest competitive strategy with benchmarking data of major competitors until next SVB [Supervisory Board] Meeting, which will fall on 11th July." Major competitors are SDI, Thomson, MTPD, and regional competitors. Information requested about competitors includes restructuring information, operational information, purchasing information, and financial information. The requested information seems detailed enough to require non-public sources. Albertazzi, Felice, 17 June 2005, Email: Fw: Request to Submit Competitors information for SVB meeting at Jul, PHLP-CRT-029020 - PHLP-CRT-029021, at 9021.

[37] Netz Merits Report, at 26-81.

[38] See Netz, Janet S., 01 October 2012, Declaration of Janet S. Netz, Ph.D., In Support of Motion of Indirect-Purchaser Plaintiffs For Class Certification, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Netz Class Cert Report"), at 65-72.

[39] Netz Merits Report, at Section VIII.A.1.c.

[40] Willig Opposition Report, at ¶58.

[41] Willig Opposition Report, at ¶58.

[42] See, e.g.,

- The European Union fined six CRT producers a total of $1.92 billion. Chee, Foo Yun, 05 December 2012, EU imposes record $1.9 billion cartel fine on Philips, five others, Reuters, http://www.reuters.com/article/2012/12/05/us-eu-cartel-crt-idUSBRE8B40EK20121205, accessed 25 September 2014.

competitive charges.[44] Depending on the outcome of the present litigation, Defendants could pay billions of dollars in civil damages.[45] These costs are on top of the resources, time, and effort Defendants expended to actually participate in the cartel.

- The United States Department of Justice fined Samsung SDI $32 million. 18 March 2011, Samsung SDI Agrees to Plead Guilty in Color Display Tube Price-Fixing Conspiracy, U.S. Department of Justice, http://www.justice.gov/atr/public/press_releases/2011/268592.htm, accessed 25 September 2014.
- Japan fined CRT producers a total of $37.4 million. Tejada, Carlos, 08 October 2009, Japan Fines Panasonic for Price Fixing, The Wall Street Journal, http://online.wsj.com/articles/SB10001424052748703298004574458873658696910, accessed 25 September 2014.
- South Korea's antitrust agency fined four CRT producers a total of $47.5 million. 11 December 2011, Watchdog fines 4 CRT glass makers for price fixing, Yonhap News Agency, http://english.yonhapnews.co.kr/techscience/2011/12/11/99/0601000000AEN20111211002300320F.HTML, accessed 25 September 2014.

[43] A number of CRT manufacturers settled with direct purchasers of their products

- Toshiba paid a $13.5 million settlement to direct purchasers. McAfee, David, 15 February 2013, Toshiba Reaches $14M Deal In Cathode Ray Price-Fixing MDL, Law360, http://www.law360.com/articles/416330/toshiba-reaches-14m-deal-in-cathode-ray-price-fixing-mdl, accessed 25 September 2014.
- Hitachi paid a $13.4 million settlement to direct purchasers. Prochilo, Dan, 09 December 2013, Hitachi Reaches $13.4M Deal in Cathode Ray Price-Fixing MDL, Law360, http://www.law360.com/articles/494176/hitachi-reaches-13-4m-deal-in-cathode-ray-price-fixing-mdl, accessed 25 September 2014.
- Panasonic paid a $17.5 million settlement to direct purchasers. Sundar, Sindhu, 06 July 2012, Panasonic To Pay $17.5M To Settle Ray Antitrust MDL, Law360, http://www.cpmlegal.com/media/news/88_Panasonic%20To%20Pay%20_17.5M%20To%20Settle%20Cathode%20Ray%20Antitrust%20MDL%20_7-6-12_.pdf, accessed 25 September 2014.
- Philips paid a $27 million settlement to direct purchasers, while Chunghwa paid $10 million. Gold, Django, 27 March 2012, Philips, Chunghwa Pay $37M To End CRT Price-Fixing Claims, Law360, http://www.law360.com/articles/323848/philips-chunghwa-pay-37m-to-end-crt-price-fixing-claims, accessed 25 September 2014.
- Samsung paid a $33 million settlement to direct purchasers. Bucher, Anne, 12 March 2014, Samsung Agrees to $33M CRT Price-Fixing Class Action Settlement, Top Class Actions, http://topclassactions.com/lawsuit-settlements/lawsuit-news/19945-samsung-agrees-33m-crt-price-fixing-settlement/, accessed 25 September 2014.

[44] See, e.g.,

- C.Y. Lin was indicted in February of 2009. 10 February 2009, Indictment of Chen Yuan Lin, United States of American v. Cheng Yuan Lin, a.k.a. C.Y. Lin (United States District Court Northern District of California San Francisco Division).
- Seung-Kyu Lee, Yeong-Ug Yang, and Jae-Sik Kim were indicted in November 2010. 09 November 2010, Indictment of Seung-Kyu Lee, et al., United States of American v. Seung-Kyu Lee, et al. (United States District Court Northern District of California San Francisco Division).
- Wen Jun Cheng was indicted in August 2009. 18 August 2009, Indictment of Wen Jun Cheng, a.k.a. Tony Cheng, United States of American v. Wen Jun Cheng (United States District Court Northern District of California San Francisco Division).

These costs, while large, are not atypical. The recent LCD cartel (which involved several of the CRT Defendants) paid $2.5 billion in fines to antitrust authorities (including $1.4 billion in fines in the U.S.) and at least $1.9 billion in payments to private claimants.[46]

The magnitude of these costs indicates that the benefit from cartel participation must have been commensurately large. It would have been irrational for Defendants to continue to participate in the cartel if they only achieved sporadic, temporary, small increases in some CPT prices.

- Chung Cheng Yeh was indicted in March of 2010. 30 March 2010, Indictment of Chung Cheng Yeh, United States of American v. Chung Cheng Yeh (United States District Court Northern District of California San Francisco Division).

[45] Netz Merits Report Section IX.

[46] In the United States, eight producers of LCD screens were fined a total of $1.4 billion.

- Gullo, Karen, 18 December 2012, AUO Executive Found Guilty in LCD Price-Fixing Case, Bloomberg, http://www.bloomberg.com/news/2012-12-18/auo-executive-found-guilty-by-jury-in-lcd-price-fixing-case-1-.html, accessed 25 September 2014.

Outside of the United States, producers of LCD screens were fined a sum of $1.1 billion by competition agencies.

- The European Union fined six LCD producers a total of $861 million. Henson, Carolyn, 09 December 2010, LCD firms fined for alleged price fixing, The Wall Street Journal, http://online.wsj.com/articles/SB40001424052748703493504576007361215813164, accessed 25 September 2014.
- South Korea fined six LCD producers a total of $175.7 million. Lee, Jung-Ah, 31 October 2011, Seoul Fines Six LCD Manufacturers in Price-Fixing Case, The Wall Street Journal, http://online.wsj.com/news/articles/SB10001424052970204528204577007682854719686, accessed 25 September 2014.
- China fined six LCD producers a total of $56.6 million. Qi, Liyan, 04 January 2013, China Fines Makers of LCD Screens, The Wall Street Journal, http://online.wsj.com/news/articles/SB10001424127887323374504578220862089391652, accessed 25 July 2013.
- Japan fined Sharp $3 million for its anti-competitive acts. Bettex, Morgan, 18 December 2008, Japan Fines Sharp $3M In LCD Price-Fixing Scheme, Law360, http://www.law360.com/articles/80800/japan-fines-sharp-3m-in-lcd-price-fixing-scheme, accessed 25 July 2013.

Private claimants have been paid a total of $1.9 billion by LCD producers

- Indirect purchasers reached a settlement for $1.1 billion. Boyette, Chris, 16 July 2012, What the $1.1 billion LCD price-fixing settlement means for you, CNN Money, http://money.cnn.com/2012/07/16/technology/lcd-class-action-settlement/, accessed 25 September 2014.
- Direct purchasers were awarded $479 million in damages. James, Ben, 11 September 2012, Toshiba To Pay Direct LCD Buyers $30M In Price-Fixing MDL, Law360, http://www.law360.com/articles/377122/toshiba-to-pay-direct-lcd-buyers-30m-in-price-fixing-mdl, accessed 08 April 2014.
- Payments to individual plaintiffs sum to a minimum of $349 million, as most settlement values have not been disclosed. Scott Flaherty, Motorola Settles LCD Price-Fixing Suit Against Philips, Law360 (October 9, 2012), http://www.law360.com/articles/384964/motorola-settles-lcd-price-fixing-suit-against-philips and Jonathan Randles, Dell Drops LCD Price-Fixing Claims Against AUO To Exit MDL, Law360 (January 18, 2013), http://www.law360.com/articles/408520/dell-drops-lcd-price-fixing-claims-against-auo-to-exit-mdl, accessed 25 July 2013.

C. CRT industry characteristics do not prevent an effective cartel

Several Defendants' experts describe a variety of CRT industry characteristics that they assert make forming and operating an effective cartel "more difficult",[47] "less likely",[48] "highly compromised",[49] or "[tend] to destabilize" and "undermine"[50] price- and output-fixing agreements.[51] A couple of Defendants' experts also agree that there are some CRT industry characteristics that facilitate a cartel.[52]

Dean Snyder justifies the discussion of CRT industry characteristics as "an essential starting point" to determining whether a cartel "would have relatively more or less difficulty" in operating effectively.[53] The problem with the discussions proffered by Defendants' experts is that whether the cartel had "more or less difficulty" in operating is beside the point. The relevant questions are whether a cartel existed, whether the cartel was able to increase price above the competitive level, and if it could, to quantify the overcharge.

Evidence, including a guilty plea from Samsung SDI, investigations by various competition agencies including the Department of Justice, the European Commission, the Korean Fair Trade Commission, and the Japanese Fair Trade Commission,[54] documents created in the course of operating the cartel,[55] and testimonial evidence,[56] clearly indicate that a cartel did exist. In my

[47] Guerin-Calvert Opposition Report, at 3.

[48] Guerin-Calvert Opposition Report, at 3; Willig Opposition Report, at 7.

[49] Rubinfeld Opposition Report, at 15.

[50] Snyder Opposition Report, at 25.

[51] Rubinfeld Opposition Report, at 5. In his deposition, Prof. Rubinfeld stated that he did not have an opinion as to whether "there was an effective cartel at all." Deposition of Daniel Rubinfeld, 08 September 2014, at 35:8-10.

[52] Willig Opposition Report, at 15 and Deposition of Edward Snyder, 11 September 2014, at 123:3-10 and 124:6-21.

[53] Snyder Opposition Report, at ¶12.

[54] Netz Merits Report, at Section III.

[55] See, e.g., the cartel meeting notes referenced generally throughout Netz Merits Report as well as Exhibits 1, 27, 28, 29, and 39 in Netz Merits Report.

[56] See, e.g.,

- [redacted]
- [redacted]
- [redacted]
- W.R. Kim, CPT sales manager for Samsung America, testified: "Q. During your tenure at Samsung SDI America, you were provided copies of glass meeting reports, correct? [objection omitted] THE WITNESS:

class certification report, class certification rebuttal, and merits report, I examined the industry characteristics that are necessary for the cartel to raise price above the competitive level.[57] In addition I described and evaluated the various practices used by the cartel, including an empirical investigation into the direct effect of one of the cartel's tactics on actual prices. In my merits report I go on to empirically estimate the extent to which the cartel was able to raise price above the competitive level.[58]

As Prof. Willig puts it, "Although the CPT industry is characterized by features that likely undermine any effectiveness of the alleged cartel, it is also true that the CPT industry is characterized by other factors that economists have identified as facilitating collusion (for example, high entry barriers due to substantial sunk costs of setting up CPT plants). Thus, whether or not the CPT cartel alleged by the IPP class was consistently effective in elevating the prices of all (or most) products to all or most customers during the nearly 13-year class period is ultimately an empirical question that needs to be resolved by examining the evidence on record."[59]

1. The CRT industry has the characteristics that are necessary for a cartel to raise price above the competitive level

Yes, I did. BY MR. GRALEWSKI: Q. Okay. So, during your tenure at Samsung SDI America, you were aware that CRT makers were meeting and agreeing on price, correct? [objections omitted] THE WITNESS: Yes." 02 July 2014, Videotaped Deposition of W.R. Kim, Volume II (Hereinafter "Deposition of W.R. Kim, Vol. II, 05 July 2014"), at 249:24 - 251:16.

- Kyu In Choi, LPD America sales account manager, testified that he attended meetings with competitors to reach agreements on CPT pricing to specific customers. "Q. Did the meetings you attended, were these meetings with LG's competitors in the CPT markets? [objection omitted] THE WITNESS: While I work for the CPT sales team, I attend the meeting with -- I attend the meeting with the CPT competitor. […] Q. So were prices to specific customers discussed at the meetings? A. Yes. Yes, ma'am. Q. Okay. And was there an agreement reached among the competitors for particular prices for particular customers? A. Yes." 25 August 2014, Videotaped Deposition of Kyu In Quin Choi, Volume I (Hereinafter "Deposition of Kyu In Quin Choi, Vol. I, 25 August 2014"), at 74:7 - 76:20.
- Jim Smith, LPD regional manager, testified: "Q. And what were the proposals, what types of proposals were they seeking approval from the senior people? A. They would try to hold prices at this kind of level on each product type. […] Q. There was agreement? A. There was agreement. Q. And you said that one of the topics would be setting prices at certain levels, correct? [objection omitted] A. It would be a conclusion. The regional managers would in this consolidated document be informing the senior management of what the price levels would be and in the absence of objection from the senior managers that was taken as approval. MR. WILLIAMS: When you're talking about what the price levels would be, you mean future prices? A. Future prices." 12 December 2013, Deposition of Jim Smith, Volume I (Hereinafter "Deposition of Jim Smith, Vol. I, 12 December 2013"), at 59:20 - 60:21.

[57] Netz Class Certification Report at Section V, Netz Class Certification Rebuttal at Section VII.B., and Netz Merits Report, at Appendix 1.

[58] Netz Merits Report, at Section IX.

[59] Willig Opposition Report, at 15. Dean Snyder agrees; "It's a necessary starting point. It doesn't give you a final answer." Deposition of Edward Snyder, 11 September 2014, at 15:15-16.

I described and evaluated in my merits report the industry characteristics that are necessary for a cartel to be able to increase price above the competitive level – the existence of barriers to entry and the absence of close substitutes.[60]

If there are no barriers to entry at all, a cartel will not be able to increase price above the competitive level. The instant that they did so, entry would occur and price would be competed back down to the competitive level. Defendants' experts either agree explicitly that barriers to entry exist or ignore the topic.[61]

The existence of products not covered by the cartel *can* prevent a cartel from raising price above the competitive level if such products are sufficiently good substitutes for the products covered by the cartel. The logical products to consider for this case are alternative display technologies – LCDs and plasma. While these display technologies are not substitutes in production (that is, a CRT TV manufacturer cannot simply switch the CRT tube for an LCD panel), they are substitutions in consumption (that is, a consumer can easily switch from a CRT TV to an LCD TV). I evaluated the strength of substitution from these technologies in my merits report.[62] I considered both how an overcharge on CRTs would affect the relative price of CRT products and LCD products and how many customers would need to buy LCD products rather than CRT products to make the imposition of an overcharge on CRTs unprofitable. Based on those analyses, I concluded that substitution over the damages period was not sufficient to *prevent* the cartel from increasing price above the competitive level.

Prof. Willig and Ms. Guerin-Calvert claim that my analysis of alternative display technologies consists of nothing more than observing that LCDs were more expensive than CRTs, then concluding that CRTs and LCDs couldn't be economic substitutes.[63] This is a gross oversimplification and ignores the primary thrust of my argument:

- The CRT overcharge did little to change the relative price of LCD and CRT products.[64]
- An implausibly large number of consumers would need to switch from CRT to LCD products in order for LCDs to eliminate the ability of a cartel to increase the price of CRTs above the competitive level.
- Given the results of the first two bullet points, I conclude that a small change in relative prices of products, given an overcharge on CRTs, would not induce a sufficiently large

[60] Netz Merits Report, at 33-41.

[61] Prof. Willig acknowledges the existence of barriers to entry (see Willig Class Cert Report, at 38 and Willig Opposition Report, at 15) and that barriers to entry facilitate collusion (Deposition of Robert Willig, 19 September 2014, at 123:19-125:8). Ms. Guerin-Calvert, Prof. Ordover, Dr. Howell, Prof. Rubinfeld, Dean Snyder, Dr. Williams, and Dr. Wu do not discuss barriers to entry.

[62] Netz Merits Report, at 40-41 and Exhibits 25 and 26.

[63] Willig Opposition Report, at ¶20 and Guerin-Calvert Opposition Report, at footnote 31.

[64] For example, a $10 overcharge for a $100 CPT that is incorporated into a $200 CRT TV doesn't change the relative price of the two types of TVs if a comparable LCD TV costs $600. Without the overcharge, consumers are faced with the choice between a $200 CRT TV and a $600 LCD TV. With the overcharge, the choice is between a $210 CRT TV and a $600 LCD TV. I have written this example as if pass-through of the CRT cost is 100%. My point is even stronger if pass-through is less than 100% as some Defendants' experts assert.

number of consumers to switch from CRT to LCD so as to prevent the CRT price from rising above the competitive level.

Defendants' experts, including Prof Willig and Ms. Guerin-Calvert, do not contest these points. None of Defendants' experts dispute my analysis of the degree of substitution between CRTs and LCDs (indeed, none of Defendants' experts refer to this part of my merits report at all) or suggests that substitution is so severe that it would prevent the CRT cartel from raising price above the competitive level.

While the presence of very high substitutability is necessary for a cartel to be *prevented* from raising price at all, lower degrees of substitutability can impact the magnitude of the overcharge. Defendants' experts do discuss the constraint that the availability of other display technologies (Defendants' experts consider the same alternative technologies that I do, LCDs and plasma) put on the ability of the CRT cartel to increase price.[65] I allow for this constraint in my estimate of overcharges through the inclusion of a variable that captures the market penetration of other display technologies.[66]

2. The presence or absence of other CRT industry characteristics are not useful for evaluating whether the CRT cartel was able to increase CRT prices above the competitive level

The presence or absence of the other industry characteristics discussed by Defendants' experts are not dispositive regarding the existence or effectiveness of the CRT cartel. For these characteristics, economic theory is ambiguous as to whether the characteristic hinders or facilitates a cartel and cartels have been observed that have the characteristic.

a) Economic theory gives ambiguous predictions for many CRT industry characteristics

While Defendants' experts mention the ways in which industry characteristics can hinder a cartel, other economic models have shown that some of these characteristics can facilitate a cartel, under different assumptions. Because the existence of these industry characteristics is neither necessary nor sufficient for an effective cartel, I do not spell out the economic mechanism under which a particular industry characteristic hinders or facilitates the operation of a cartel. Instead, I list the characteristic that Defendants' experts claim hinders a cartel and supply a citation to an economic study that shows that the same characteristic can facilitate a cartel.

- Decreasing capacity and exit:[67] Cartels may collude in declining industries in order to facilitate collusion in other markets.[68]
- Demand volatility:[69] Demand volatility can make it more likely for a cartel to develop.[70]

[65] Willig Opposition Report, at ¶17; Ordover Opposition Report, at ¶15; Snyder Opposition Report, at ¶¶41, 47, 53, and 68; and Williams Opposition Report, at ¶38.

[66] Netz Merits Report, at 103.

[67] Rubinfeld Opposition Report, at ¶¶59-60.

[68] Harrington, Joseph E., Jr., February 1987, Collusion in Multiproduct Oligopoly Games under a Finite Horizon, International Economic Review, Vol. 28, No. 1, 1-14.

- Increasing capacity:[71] Not only can collusion exist in the presence of excess capacity, but collusion can exist when capacity is increasing.[72]
- Product differentiation:[73] Product homogeneity (the opposite of product differentiation) has been shown to hinder collusion.[74]
- Vertical integration:[75] Asymmetric vertical integration has been shown to facilitate collusion.[76,77]

b) Real world cartels have industry characteristics that theoretically make collusion more difficult

There are real-world cartels that have many of the characteristics that Defendants' experts claim create obstacles to the effective operation of a cartel, adding more evidence to my assertion that the presence of these industry characteristics are not informative as to the existence and effectiveness of a cartel.

- Changes in relative capacity: LCD cartel[78]
- Disagreements between cartel members: Graphite electrodes cartel[79]
- Economies of scale: DRAM cartel/industry[80,81]

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[69] Snyder Opposition Report, at ¶¶41, 48-51.

[70] Sjostrom, William, 1989, Collusion in Ocean Shipping: A Test of Monopoly and Empty Core Models, Journal of Political Economy, Vol. 97, No. 5, 1160-1179.

[71] Rubinfeld Opposition Report, at ¶¶62-66 and Williams Opposition Report, at ¶23.

[72] Davidson, Carl, and Raymond Deneckere, 1990, Excess Capacity and Collusion, International Economic Review, 31(3), 521 - 541.

[73] Willig Opposition Report, at ¶¶25-27; Guerin-Calvert Opposition Report, at ¶¶45-50; Snyder Opposition Report, at ¶27; and Williams Opposition Report, at ¶¶37-38.

[74] Chang, Myong-Hun, 1991, The Effects of Product Differentiation on Collusive Pricing, International Journal of Industrial Organization, Vol. 9, 453 - 469.

[75] Willig Opposition Report, at ¶¶28-29; Guerin-Calvert Opposition Report at ¶34; and Snyder Opposition Report, at p. 26.

[76] Nocke, Volker and Lucy White, September 2007, Do Vertical Mergers Facilitate Upstream Collusion?, The American Economic Review, Vol. 97(4), 1321 - 1339.

[77] Snyder agrees that the prediction from economic literatures is ambiguous. Snyder Opposition Report, at ¶127.

[78] Mei-Chih Hu, 2011, Technological innovation capabilities in the thin film transistor-liquid crystal display industries of Japan, Korea, and Taiwan, Research Policy, at 543.

[79] Levenstein, Margaret and Valerie Y. Suslow, 2004, Contemporary International Cartels and Developing Countries: Economic Effects and Implications for Competition Policy, Antitrust Law Journal Vol. 71, No. 3, 801-852, at p. 835.

[80] Brown, Clair and Greg Linden, 2009, Chips and Change: How Crisis Reshapes the Semiconductor Industry, The MIT Press: Cambridge, http://mitpress.mit.edu/sites/default/files/titles/content/9780262013468_sch_0001.pdf, accessed 23 September 2014, at 17.

[81] Dean Snyder agrees that the presence of high fixed costs and low marginal costs can hinder or facilitate a cartel. Snyder Deposition, 124:22-125:10.

- Firms exiting the industry: DRAM[82]
- Firm heterogeneity in vertical arrangements: Quebec retail gasoline cartel[83], LCD[84]
- Firm size heterogeneity: Quebec retail gasoline cartel,[85] lysine cartel[86]
- Large number of firms in cartel: Quebec retail gasoline market[87]
- Low industry concentration: cotton textiles cartel[88]
- Opaque prices: lysine cartel[89]
- Product differentiation: graphite electrodes cartel,[90] women's swimsuits,[91] DRAM[92]
- Shifts in market share: lysine cartel,[93] vitamin cartel,[94] LCD cartel[95]
- Technological change: DRAM cartel,[96] LCD cartel[97]

[82] Siebert, Ralph and Christine Zulehner, 08 October 2013, The Impact of Market Demand and Entry Costs on Market Structure, Working Paper, at pp. 1 - 2.

[83] Clark, Robert and Jean-Francois, 2013, Collusion with Asymmetric Retailers: Evidence from a Gasoline Price-Fixing Case, American Economic Journal, Vol. 5(3), 97-123.

[84] Lee, Jeongsik, Byung-Cheol Kim, and Young-Mo Lim, 2011, Dynamic Competition in Technological Investments: An empirical examination of the LCD panel industry, International Journal of Industrial Organization, Vol. 29, 118-728, at p. 727.

[85] Clark, Robert and Jean-Francois, 2013, Collusion with Asymmetric Retailers: Evidence from a Gasoline Price-Fixing Case, American Economic Journal, Vol. 5(3), 97-123.

[86] de Roos, Nicolas, November 2006, Examining Models of Collusion: the Market for Lysine, International Journal of Industrial Organization, Vol. 24(6), 1083 - 1107, at p. 1087.

[87] Clark, Robert and Jean-Francois, 2013, Collusion with Asymmetric Retailers: Evidence from a Gasoline Price-Fixing Case, American Economic Journal, Vol. 5(3), 97-123., at p. 98.

[88] Levenstein, Margaret C., and Valerie Y. Suslow, 2006, What Determines Cartel Success?, Journal of Economic Literature, Vol. XLIV, 43-95, at p. 58.

[89] de Roos, Nicolas, November 2006, Examining Models of Collusion: the Market for Lysine, International Journal of Industrial Organization, Vol. 24(6), 1083 - 1107, at p. 1085.

[90] Harrington, Joseph E., Jr., 2006, How Do Cartels Operate?, Foundations and Trends in Microeconomics, Vol.2, No. 1, 1-105, http://assets.wharton.upenn.edu/harrij/pdf/fnt06.pdf, accessed 17 September 2014.

[91] Hay, George A. and Daniel Kelley, April 1974, An Empirical Survey of Price Fixing Conspiracies, Journal of Law and Economics, Vol. 17(1), 13-38.

[92] Brown, Clair and Greg Linden, 2009, Chips and Change: How Crisis Reshapes the Semiconductor Industry, The MIT Press: Cambridge, http://mitpress.mit.edu/sites/default/files/titles/content/9780262013468_sch_0001.pdf, accessed 23 September 2014, at pp. 28 - 29.

[93] Harrington, Joseph E., Jr., 2006, How Do Cartels Operate?, Foundations and Trends in Microeconomics, Vol.2, No. 1, 1-105, http://assets.wharton.upenn.edu/harrij/pdf/fnt06.pdf, accessed 17 September 2014.

[94] Harrington, Joseph E., Jr., 2006, How Do Cartels Operate?, Foundations and Trends in Microeconomics, Vol.2, No. 1, 1-105, http://assets.wharton.upenn.edu/harrij/pdf/fnt06.pdf, accessed 17 September 2014.

[95] Lee, Jeongsik, Byung-Cheol Kim, and Young-Mo Lim, 2011, Dynamic Competition in Technological Investments: An empirical examination of the LCD panel industry, International Journal of Industrial Organization, Vol. 29, 118-728, at p. 719.

- Volatile demand: ocean shipping cartel,[98] LCD cartel[99]
- Volatility of other variables: Quebec retail gasoline cartel,[100] LCD cartel,[101] hydrogen peroxide cartel[102]

3. Defendants' experts exaggerate the degree and impact of product differentiation

Defendants' experts particularly focus on two related industry characteristics – the degree of product differentiation and product introduction. They claim that the CRT industry is characterized by a high degree of product differentiation and new product introduction and that this would have impeded the cartel's efforts to fix prices.[103] These claims fail on both a theoretical level and because they assert industry characteristics that are contrary to fact.

Even if product differentiation and product introduction did make collusion "more difficult", Defendants' experts' analyses regarding production differentiation and product introduction are so fundamentally flawed that their results are misleading and incapable of supporting reliable expert opinion. The evidence does not support Defendants' experts' claims that there was a great deal of product diversity or that there were many new product introductions of short-lived products. On the contrary, the evidence demonstrates a strong focus on a small set of products with substantial stability, having only slow migrations from one small set of economically significant models to another small set.

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[96] Kim, Chang-Wook and Keun Lee, 19 July 2001, Innovation, Technological Regimes and Organizational Selection in Industry Evolution: A History Friendly Model of the DRAM Industry, Industrial and Corporate Change, Vol. 12(6), 1195-1121.

[97] Lee, Jeongsik, Byung-Cheol Kim, and Young-Mo Lim, 2011, Dynamic Competition in Technological Investments: An empirical examination of the LCD panel industry, International Journal of Industrial Organization, Vol. 29, 118-728, at p. 720.

[98] Bolotova, Yuliya, Connor, John, and Douglas J. Millar, April 2006, Cartel Stability: An Empirical Analysis, Selected Paper from International Industrial Organization Conference, Boston, MA, at p. 4.

[99] Lee, Jeongsik, Byung-Cheol Kim, and Young-Mo Lim, 2011, Dynamic Competition in Technological Investments: An empirical examination of the LCD panel industry, International Journal of Industrial Organization, Vol. 29, 118-728, at p. 720.

[100] Clark, Robert and Jean-Francois, 2013, Collusion with Asymmetric Retailers: Evidence from a Gasoline Price-Fixing Case, American Economic Journal, Vol. 5(3), 97-123.

[101] Lee, Jeongsik, Byung-Cheol Kim, and Young-Mo Lim, 2011, Dynamic Competition in Technological Investments: An empirical examination of the LCD panel industry, International Journal of Industrial Organization, Vol. 29,118-728, at p. 720.

[102] Ms. Guerin-Calvert testified: "Q Based upon your experience as a [sic] economist of industrial organizations, are you aware of any actual real world cartels that had as a characteristic rapid growth and capacity output in models? A Yes. Q Can you identify them? A I'm aware only generally because I haven't been involved in it that LCD is something that's alleged to be a cartel. […] Another example is there was a [sic] alleged cartel in hydrogen peroxide and I believe there was a very significant amount of capacity expansion, a lot of different grades of the product in hydrogen peroxide." Deposition of Margaret Guerin-Calvert, 17 September 2014, at 103:4 - 19.

[103] Guerin-Calvert Opposition Report, at ¶¶45-49, Snyder Opposition Report at ¶¶41-47, and Deposition of Margaret Guerin-Calvert, 17 September 2014, at 139:1 – 10.

To describe the flaws in Defendants' experts' attempts at measuring the degree of product differentiation, I rely on World Type Designation System (WTDS) codes, a standardized code many firms use. As I explained in my Class Certification Rebuttal Report, the product "family", denoted by the first six characters of a CRT's WTDS code, is the appropriate level for considering economically relevant product differentiation.[104]

In my class certification rebuttal report, I showed that CRT production was highly concentrated in a small number of product families at each manufacturer. Additionally, specific CDT (and CPT) models, even when "model" is defined narrowly to include the minor design classification, were sold to multiple customers, rather than being specifically designed for each customer.[105]

Instead of analyzing the diversity of product families, Defendants' experts analyze individual model numbers, which are too specific to be economically meaningful. For example, Ms. Guerin-Calvert treats ITC and customer variations as attributes meaningful for distinguishing one model of CDT from another.[106] It is neither innovation nor product differentiation to sell an existing product to a different customer.[107] Similarly, selling identical CRTs, one with the ITC

[104] "The first character of the WTDS code indicates the application and aspect ratio (wide-screen vs. normal) of the model. The second and third characters indicate the diagonal length of the screen in centimeters. The fourth, fifth, and sixth characters give the major design classification, which includes characteristics such as deflection angle, neck diameter, shape, mask pitch, and electron gun information. Industry sources refer to these as delineating the product family. Matsushita Toshiba Picture Display, 28 December 2004, Project Name Registration Standard, MTPD-0347731 - MTPD-0347738 at 10. Samsung SDI Germany, February 2001, Samsung A68QCP891X430 at 4. MT Picture Display, 12 December 2001, D0753-101, MTPD-0652301 - MTPD-0652307, at 2304E – 2305E." Netz, Janet S., 15 February 2013, Rebuttal Declaration of Janet S. Netz, Ph.D., in Support of Motion of Indirect-Purchaser Plaintiffs for Class Certification, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Netz Class Cert Rebuttal"), at 10 and footnote 29.

As support for "family" being the appropriate granularity for considering products "distinct", my hedonic regressions demonstrated that 91% of the variation in CDT prices and 97% of the variation in CPT prices can be explained by size, shape, and finish. See Netz Merits Report VIII.A.4.b)2). Finish, while economically significant, is *not* relevant when measuring product differentiation or innovation. All of the members of a product family are identical with each other on all other attributes significant to pricing (those attributes in my hedonic regression).

I will also reference minor design classifications in the text. Minor design classifications are denoted by variations in the two or three characters, typically digits, following the product family but before the "X" that is in almost all WTDS codes in our data (the 'X', or 'XX', denote color phosphors; naturally most color display tubes and color picture tubes have color phosphors). Minor design classifications represent subdivisions within a product family having minor differences. Examples of differences that could cause different minor design classifications are, for example, having mounting lags toward the back of the reinforcing band instead of toward the front of the band; or being NTSC only; or having slight variations in electron guns.

[105] Netz Class Cert Rebuttal, at 9-14 and Exhibit 14.

[106] Ms. Guerin-Calvert's analysis used "data that was [sic] aggregated to the level of CDT size, finish, manufacturer, model number and customer." Guerin-Calvert Opposition Report, at ¶45, footnote 63.

[107] It is possible Ms. Guerin-Calvert included customer information because of her erroneous belief that CDTs are uniquely designed for each customer. She asserts "that CDT manufacturers often must design their products specifically for a given manufacturer's needs based on 'design in competition'." (Guerin-Calvert Opposition Report, at ¶46.) She incorrectly asserts that I "recognize" this fact, citing to Netz Expert Report, at 10-11. However, the text she cites says only that CRT manufacturers engage in design-in competitions when TV or monitor manufacturers develop new models. That text says nothing about whether CRT manufacturers use existing or new designs in these competitions. In general, manufacturers use existing designs in these competitions: "CRTs were generally *not* designed for a specific customer nor heavily customized for each purchaser. Rather, CRT manufacturers each had a

installed and another to which the buyer will attach ITC acquired separately, is neither innovation nor product differentiation.[108]

Consider an analogy – suppose the task was to analyze the amount of product differentiation in the automobile industry; one could analyze it several levels of specificity. Analysis based on the numbers of vehicle types (e.g., full-size, mid-size, compact, SUV) would understate the amount of meaningful product differentiation because the categories include too many different types of cars (e.g., full-size cars could include a Hyundai Sonata and a Mercedes S-class). Analysis based on the most detailed description of a vehicle (e.g., including make, model, options packages, and color) would overstate the amount of meaningful product differentiation because the categories treat vehicles that are not meaningfully different (e.g., otherwise identical cars that are painted red and blue) as distinct. The proper level of product aggregation is somewhere in between these two extremes, perhaps at the model level (e.g., a Ford Focus) or at the model-options level (e.g., the base model of the Ford Focus).

The distinctions between CRTs within the same product family are not generally meaningful, while the distinctions between products that are in different product families are generally meaningful. This indicates that product families are the proper level of aggregation for analysis of product differentiation and that Defendants' experts have chosen an inappropriately specific definition of product type.[109]

When Defendants' data are examined in terms of distinct product designs – the WTDS family code – a *lack* of product differentiation is revealed.

[redacted]

limited number of major product designs, which they could alter in various minor ways. A given minor alteration was typically sold to multiple customers. Furthermore, the minor variations generally have quite limited price differentials across them. This is readily seen by examining the Defendants' sales data." [Emphasis in original, internal citation omitted] Netz Class Cert Rebuttal, at 10.

[108] Netz Class Cert Rebuttal Report, at 12.

[109] Ms. Guering-Calvert agrees that the appropriate question is whether "using some very basic characteristics is it a homogenous product or does it look more like a heterogeneous product." However, by failing to assess whether her chosen granularity – in this case, "model number" – actually identifies "very basic characteristics" or instead identifies exceedingly minute details, her study fails to perform the task she expected of it. Similarly, it is not appropriate to consider customer identify if one wants to draw conclusions about product homogeneity, a lack thereof, or the amount of new product innovation or introductions

[110] [redacted]

[redacted]

Similar patterns of sales being concentrated on a narrow range of products are seen in CPTs. For example, 100% of Hitachi's sales of 34" CPT, over the entire period the Hitachi data report sales of 34" CPT, are one specific tube: A80LJF.[113]

Ms. Guerin-Calvert testified that the high rate of new product introduction was a significant factor in her belief that the cartel was unlikely to be successful.[114] However, she has not performed any analysis of the rate of product introduction or the length of product lifetimes. Instead, she relies on a flawed analysis that simply counts the number of products sold each year. As I explained above, her results depend on an unreasonably narrow definition of what constitutes a distinct product. As I show below, rather than being characterized by high rates of new product introduction, CRTs had long product lifetimes, with a given tube design generally marketed for several years and only slowly transitioning to new designs.

Dean Snyder claims the CRT industry was characterized by high rates of new product introductions.[115] As support for his claim, he counts the number of new product introductions as the number of models first observed in a given year. However, his analysis is inherently incapable of providing support for his claim, because his definition of a distinct "model" includes attributes such as ITC variations and other attributes not related to the actual CRT design. For at least Samsung, the model number can include information about the customer to whom the product is sold.[116] As I explained above, this definition of "model" is too narrow to be economically meaningful. Dean Snyder's analysis treats each of these – selling a product to multiple customers, selling a product with one ITC versus another or selling it bare – as new and different CRTs. This is wrong and renders his analysis uninformative and misleading.

For an example of how he overstates innovation, consider the Toshiba M41LLH.[117] Per the WTDS standard, every tube in this family has the same basic design: "same deflection angle, neck diameter, bulb shape, electric gun large scale design, electronic gun line, lighting

[redacted]

[113] This was not a minor product: Hitachi sold almost 2.8 million of them from 1997-2003. See hitachi_34_cpt_share.log in my backup.

[114] "[A.] I concluded and had formed an opinion based on all of my analysis that the type of heterogeneity that is here makes it – made the likelihood that this cartel, alleged cartel, *particularly given* the mechanisms that it used with regard to target prices *and the fact that differentiation was in the form of new model introductions as well* made it – an industry condition made it much less likely that a cartel here could be effective." [Emphasis added.] 17 September 2014, Deposition of Margaret Guerin-Calvert, at 139:1 - 10.

[115] Snyder Opposition Report, at ¶¶45-47.

[116] The Samsung data used by Dean Snyder are the data I used in my merits report. These data include customer-specific information in the model number field used by Dean Snyder for identifying distinct models. SDI, Undated, SDI CRT Model Number Decoder, SDCRT-0021274 - SDCRT-0021277, at 1274.

[117] The 'M' indicates this is a CDT, the 41 indicates it is a 17" tube. I chose Toshiba as an example because it is Dean Snyder's client. As my discussion of Chunghwa and Hitachi, above, and further discussion of Chunghwa, below, indicate, the problem of Dean Snyder overcounting models and product introductions exists across the Defendants' data.

membrane structure, mask pitch, lighting condition major design, support structure."[118] The M41LLH first appears in 1996 and is sold until 2002, with a total of almost 6 million tubes being sold. Dean Snyder's analysis reports this single design as being 53 distinct models, with introduction dates as late as 2000.[119] The same problems exist among CPTs.[120] Considered another way, Toshiba's top 20 tube designs account for over 75% of Toshiba's unit sales across Toshiba's entire CRT sales data. Dean Snyder counts 813 distinct model numbers across those 20 tube designs. It is clear that Dean Snyder's analysis fails to assess any economically relevant measure of product differentiation or rate of innovation. The problem is not limited to Toshiba; it exists for all vendors.[121]

The evidence does not support Defendants' experts' claims that there was a great deal of product diversity or that there were many new product introductions of short-lived products. On the contrary, the evidence demonstrates a strong focus on a small set of products with substantial stability, having only slow migrations from one small set of economically significant models to another small set.

Prof. Willig presents an analysis, summarized in his Exhibit 5, purporting to show great diversity in CPT prices. His Exhibit 5 is a slight modification of Exhibit 1A from his Class Certification [Opposition] Report, changing from presenting monthly price plots to quarterly plots. As I demonstrated in response to the earlier version,[122] charts such these – simply plotting all observed prices without regard for quantities or product distinctions – not only fail to help the finder of fact assess the existence or size of cartel overcharges, but are misleading.

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[118] MT Picture Display, 12 December 2001, D0753-101, MTPD-0652301 - MTPD-0652307, at 2305E.

[119] Even if I were to include the minor design classification – which includes all attributes of the tube as it is manufactured, but allows for variations like which neck components (ITC) are installed after the tube is manufactured – the most popular version, the M41LLH507, would be counted as 25 distinct models in Dean Snyder's analysis. See toshiba_wtds_major_shares.log in my backup.

[120] The A48KZL is Toshiba's highest volume CPT ('A' indicates it is a 4:3 CPT; the 48 indicates it is a 20" tube). The tube first appears in the Toshiba data in 1994 and is sold until 2001, with a total of 5.1 million units sold. Dean Snyder's analysis would report this single design as being 21 distinct models, with introduction dates as late as 2000. See toshiba_wtds_major_shares.log in my backup.

[121] In fact, the problem is much worse for Chunghwa. I performed a rough check on how severe the problem is with Chunghwa by examining the data in CHWA_combined.dta. I examine these data, rather than the data directly underlying Dean Snyder's analysis, because the Chunghwa WTDS data fields are not in the data used by Dean Snyder. I examined its largest selling design – the M34AFA. These were identified as products in CHWA_combined.dta having "M34AFA" in the "original_CHWA_model_number" field. I then counted the distinct values in "model_number", the field used for defining Chunghwa models in Dean Snyder's analysis. Dean Snyder presumably counts 564 distinct "models" for this single tube design. See chunghwa_model_no.log in my backup.

I expect the Samsung data overstate "model" counts to much the same degree as do the Chunghwa data (because of the degree of granularity in Samsung's model numbers – SDI, Undated, SDI CRT Model Number Decoder, SDCRT-0021274 - SDCRT-0021277, at 1274.). However, we have no WTDS information from Samsung to allow me to even roughly quantify the ratio between Samsung's model numbers and their WTDS product families.

None of the defendant data report only WTDS codes for model numbers. Although Hitachi's and Toshiba's model number includes the full WTDS code (including minor design classification and deflection yoke specification) for almost all observations, the model number also includes non-WTDS codes for most observations.

[122] Netz Class Cert Rebuttal, at 7-9.

Prof. Willig purports to have addressed my earlier criticisms, asserting that adding quantity weights has little impact on his conclusions regarding price dispersion.[123] Adding quantity weights has little impact because Prof. Willig ignored the other part of my criticism of his earlier analysis: the inappropriate and misleading examination of prices without concern for relevant product attributes. Prof. Willig presents the distribution of prices in a manner that hides the very high degree of price standardization that existed. Prof. Willig commingles the prices of *all* CPTs and reports the 10th-percentile and 90th-percentile prices. Such an analysis would be appropriate if, and only if, the cartel set a single CPT price for each quarter. Of course, the cartel was more sophisticated – the cartel set different prices for different sizes of CPT. An informative analysis would examine the distribution of prices for a given size at each point in time.

In my Class Certification Rebuttal Report, I presented a series of exhibits rebutting Prof. Willig's claims of great price diversity. My exhibits reveal that CRT sales collapse into tight, orderly bands, showing very high concentrations of sales within narrow price ranges when the size, shape, and finish of the products are considered.[124] Notably, the CRT cartel explicitly considered those factors when they agreed on their target prices.

Prof. Willig's change from monthly data to quarterly data does nothing to salvage his analysis or cure its misleading implications. For example, considering the third quarter of 2001 used by Prof. Willig in his illustrative example, simply by considering size and finish, we see 74% of 14" bare CPT selling between $25.00 and $27.99 and another 16% selling between $28.00 and $29.99. At the time, the target price of a 14" bare CPT was $26.50.[125]

D. The cartel had the incentive and ability to raise the price for all CRTs

As I explained in my previous reports, Defendants had strong incentives to raise the prices of all CDTs and CPTs they sold.[126] I also explained that Defendants had sufficient market power to increase CDT and CPT prices.[127] Defendants' experts claim that Defendants either did not seek to raise prices for certain groups of CDTs or CPTs, or were unsuccessful in doing so. For example, some of Defendants' experts claim that they did not attempt to raise prices of CPTs in North America or that Defendants did not attempt to raise the prices of large CPTs.[128]

Dr. Williams argues that demand substitution would tend to blunt any efforts of the cartel to raise the price of some CRTs but not others.[129] Dean Snyder makes a similar argument and also claims

[123] Willing Opposition Report, at footnote 29.

[124] See Netz Class Cert Rebuttal Report, at Exhibits 2-13.

[125] See 14_bare_cpt.log and Target price-structure.xlsx in my backup.

[126] Netz Merits Report Section VIII.A.4.b.1.

[127] Netz Merits Report Section VIII.A.2.

[128] See, e.g.,

- Willig Opposition Report, at ¶¶34, 96.
- Williams Opposition Report, at ¶¶41, 142-143.
- Wu Opposition Report, at ¶¶83-84.

[129] Dr. Williams' reasoning is that if, for example, Defendants tried to raise the price of 15" CDTs but not 17" CDTs, then the change in the relative prices of the two sizes would cause consumers to shift demand to the 17" size.

that supply-side substitution would restrict Defendants' ability to raise the price of some CRTs but not others.[130,131]

I agree with Dr. Williams and Dean Snyder that it would be difficult for Defendants to raise the price of some CRTs but not others that are closely related. Supply and/or demand substitution could tend to blunt the effects of raising the price of some CRTs because manufacturers and/or consumers would tend to substitute to other CRTs. Defendants surely understood that raising the of, say, 15" CDTs but not 17" CDTs would be a poor strategy. [redacted]

Therefore I conclude it is highly unlikely that Defendants would attempt to raise the price of some CRTs but not others. There is overwhelming evidence that Defendants attempted to raise the price of some CRTs. Because it would be irrational to try to raise price of some CRTs but not others, this indicates that Defendants sought to raise the price of substantially all CRTs.

Defendants' experts offer no explanation why they believe Defendants would collusively raise some prices but not others. For example, it makes no economic sense to try to increase prices for

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This would reduce demand for 15" CDTs, putting some downward pressure on prices and preventing Defendants from raising price as much as they could if there was no close substitute for 15" CDTs.

[130] Snyder Opposition Report, at ¶126.

[131] Dean Snyder's reasoning is similar to Dr. Williams'. For example, if Defendants tried to restrict output of 15" CDTs but not 17" CDTs, then Defendants would shift their production capacity to the unrestricted 17" CDTs. The increase in supply of 17" CDTs would cause their price to fall. This would, presumably, make it more difficult to maintain high prices for 15" CDTs.

[132] [redacted]

small and medium CPTs while simultaneously pricing large CPTs competitively. Defendants had the incentive (higher profits) and ability (market power) to raise prices for all CPTs.

Similarly, Defendants' experts offer no explanation for why they believe Defendants would not attempt to raise prices in North America, while attempting to raise prices elsewhere. I address Defendants' incentive and ability to raise prices in North America in Section V.D.2.

1. The prices for CRTs are related via a price structure

In my previous reports, I have presented the results of what I call hedonic regressions to "show that CRT prices are determined primarily by product attributes. This analysis showed that the prices Defendants charged to direct purchasers could be closely approximated by a formula common to all direct purchasers. Based on the results, I conclude that CRT prices of different types are related to each other via product characteristics, and therefore setting a target price increase for one type of CRT implies a price increase for other CRTs."[133] Consistent with this analysis I concluded that Defendants did not need to set target prices for all CRTs in order to raise the price of all CRTs. This is one reason why I am not surprised that I have been unable to find target prices for every CRT.

Defendants' experts mischaracterize my argument. They appear to think that my argument is that the cartel could attempt to raise the prices of only some CRTs, and that this would automatically have the effect of raising all prices by the same amount.[134] For example, if Defendants raised the price of 17" CDTs, then 19" CDT prices would automatically follow because CRT prices could not deviate from the *stable* price structure. I do not claim that the price structure is stable and my conclusions are perfectly consistent with a price structure that changes over time.

I conclude that CRT prices were determined almost entirely by a handful of product characteristics, as evidenced by the results of my hedonic regression.[135] Defendants knew and relied on these relationships between product characteristics. At a given point in time, Defendants knew the difference in price between round and flat 21" CPTs, for example. Because of this, the cartel did not need to set target prices for each and every model of CRT. They could set a handful of target prices and all participants would understand the implications for prices of other related CRTs.

Consistent with this, Defendants agreed to set prices in accordance with a series of price differentials that explicitly linked the prices with product characteristics.[136] This approach has been successfully used by other cartels.[137]

My hedonic regression estimates a single relationship between CRT characteristics and prices across the entire cartel period.

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[133] Netz Merits Report, at 68-69.

[134] Willig Opposition Report, at ¶¶53-56, Guerin-Calvert Opposition Report, at ¶¶84-85, Williams Opposition Report, at ¶¶58-68, 115-117, 146-148, and Snyder Opposition Report, at ¶126.

[135] Netz Merits Report, at 66-71 and Exhibits 40 and 41.

[136] Netz Merits Report, at Section VIII.A.4.b.2 and Exhibits 39.

[137] The graphite electrodes cartel used a "pricing formula", which corresponds to what I call a "price structure". Harrington, Joseph E., Jr., 2006, How Do Cartels Operate?, Foundations and Trends in Microeconomics, Vol.2, No. 1, 1-105, http://assets.wharton.upenn.edu/harrij/pdf/fnt06.pdf, accessed 17 September 2014.

For the purpose of demonstrating that a handful of characteristics determine price, this is conservative. If I relaxed this constraint and estimated a separate regression for each year (or otherwise incorporated time into the model) I would find that the model does an *even better* job of explaining prices.

Prof. Willig and Ms. Guerin-Calvert argue that I should estimate year-by-year the relationship between product characteristics and price. So, for example, this approach may estimate that the price difference between a 15" and 17" CDT is different in 1997 and 2000. Accordingly, they cite year-by-year regression results that are similar to my hedonic regressions.[138] When I replicate their analyses, I find that my year-by-year hedonic regressions explain more of the variation in CRT prices than when I perform single regressions for the entire cartel period.[139] Thus performing the regressions for each year only strengthens my conclusion that CRT prices are determined almost entirely by a handful of product characteristics, including the date of sale. At any given time, Defendants were aware of the tight relationship between product characteristics and price.

2. The cartel had the incentive and ability to raise the prices of CRTs consumed in North America

Defendants' experts state that most CPTs sold in North America were manufactured in North America, most CPTs manufactured in North America were sold in North America, and pricing decisions were made locally. They argue that this suggests that the cartel's conspiracy to raise CPT prices failed to impact the U.S. or that the impact in the U.S. was different than the impact elsewhere.[140] In reaching their conclusions, Defendants experts ignore or dismiss out of hand virtually all of the facts and analysis presented in my opening report.[141]

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[138] See,

- Guerin-Calvert Opposition Report, at ¶84
- Willig Opposition Report, at ¶56.

[139] The hedonic regressions in my previous report explained 91.39% of the variation in CDT prices and 96.53% of the variation in CPT prices using just a handful of product characteristics. Following Defense experts' specifications, I re-ran those regressions allowing for the relationships between product characteristics and price to vary year-by-year. The updated regressions explain 94.43% of the variation in CDT prices and 97.09% of the variation in CPT prices. While my original regressions explained almost all price variation, the updated versions do even better. See defendant_data_hedonics_merits_rebuttal.smcl in my backup production.

[140] See, e.g.,

- Rubinfeld Opposition Report, at ¶¶67-90. In his deposition, Prof. Rubinfeld says that regionalization in CPT sales "raises questions" as to the impact on North American customers that lead him to conclude "that there *could* have been" a smaller effect in North America. Rubinfeld Deposition, at 12-18, emphasis added.
- Williams Opposition Report, at ¶¶28-36, 41, 47-54, 140-143.
- Willig Opposition Report, at ¶¶96-98.
- Wu Opposition Report, at ¶¶67-84.

Defendants' experts do not suggest that the cartel's impact on CDT prices was non-existent or different in the U.S. and the rest of the world.

[141] See Section VIII.A.5 of Netz Merits Report.

Defendants' experts' reasoning is inconsistent with Defendants' numerous cartel meetings and information exchanges in North America, which would be expected to affect the prices of CPTs made and sold in North America.[142] The reasoning is also inconsistent with the fact that a significant share of the CRT TVs consumed in the U.S. were manufactured outside of North America (mostly in Asia) using CPTs that were also manufactured outside of North America (again, mostly in Asia).[143] That is, CPTs were manufactured and incorporated into TVs outside of North America before being imported to the U.S. as finished goods, and these imported TVs accounted for a substantial share of CRT TVs purchased in the U.S. With the exception of Dr. Wu, Defendants' experts ignore this distribution channel and its role in the cartel's impact on prices in the U.S.

Dr. Wu presented data on the origins of CRT TVs imported into the U.S.[144] His Exhibit 8 shows that in 1995 not quite one third of all CRT TVs imported into the U.S. were from Asia. This share increased steadily over time, with imports from Asia accounting for over 60% of CRT TVs shipped to the U.S. in 2002 and over 80% in 2006. For the years 1995-2006, just over half of all TVs imported into the U.S. originated in Asia.

Defendants also sold a significant number of CRTs to purchasers in the U.S. The available Defendant sales data indicates that at least $1.028 billion of CDTs and $13.18 billion of CPTs were shipped or billed to customers in the U.S. or Mexico in the years 1995-2007.[145] Of that total, at least $630 million of CDTs and $8.6 billion of CPTs were shipped or billed to U.S. customers in the years 1995-2007.[146] These figures understate the true value of shipments to U.S. customers because I do not have complete sales data for some Defendants and some Defendants' data do not include customer location information.

Defendants' experts ignore evidence presented in my merits report that Defendants' North American collusion was intertwined with the collusive activities at their Asian headquarters and that Defendants' headquarters exerted substantial influence over North American pricing.[147]

Several of Defendants' experts argued that I identified more target prices for small CPTs than for large CPTs, and that this indicates the cartel did not attempt to raise the prices of the larger tubes, which are more popular with consumers in the U.S. They conclude that this means the cartel would not have effectively raised prices in the U.S. for larger CPTs.[148]

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[142] Prof. Rubinfeld is the only expert to acknowledge that Defendants met in North America with the intent to "coordinate on pricing and/or avoid competition". Without further analysis he asserts that any efforts to collusively raise prices in North America would be unsuccessful due to cheating. Rubinfeld Opposition Report, at ¶¶89-90.

[143] I discussed this in detail in Netz Class Cert Rebuttal, at Section VII.F.

[144] Wu Opposition Report, at ¶70 and Exhibit 8.

[145] See "us_sales.txt" from my backup for calculations.

[146] See "us_sales.txt" from my backup for calculations.

[147] Netz Merits Report, at 76-81.

[148] See e.g.,

- Williams Opposition Report, at ¶¶49-54, 140-145.
- Willig Opposition Report, at ¶¶34, 96.
- Wu Opposition Report, at ¶¶76-84.

Again, their argument ignores the following points made in my previous report:

- I have identified target prices for approximately 29.7% of all CPTs, including 13.3% of large CPTs.[149]
- The cartel had an incentive to cover up collusive activity. The fact that I was unable to identify more target prices for large CPTs may reflect that Defendants did not keep good records of that part of their collusive activity.[150]
- Target prices are not the only tool Defendants used in its attempt to raise prices above the competitive level. They also agreed to restrict output and reduce capacity, allocated customers, and exchanged sensitive information on price and market conditions.[151]

In Section VI.A.5, I describe analyses that show Defendants did, in fact, raise CRT prices in North America.

E. Defendants' information exchanges were part of a pattern of price-fixing conduct

Defendants' experts' statements that not all information exchanges between competitors are inherently anticompetitive are insufficient for refuting the case evidence that Defendants' engaged in information exchanges as part of an overall cartel strategy that had an anticompetitive

[149] Netz Merits Report, at 63 and combine_target_defendant_large_cpt.log in my backup files.

[150] See Netz Merits Report, at Section VIII.A.4. Defendants' experts agree that I have not identified all target prices. See, e.g.:

- "Q Assuming that the defendants destroyed documents that pertained to the collusive activity, it is possible that documents reflecting target prices simply don't exist for that reason, would you agree? [...] A If documents were destroyed and if those documents included additional target price documents that are included target prices, then I'd have to accept your -- by definition that there might be some target price documents that aren't available. Q You're going to give me that one? A Absolutely. Q You don't contend that Dr. Netz has identified every single target price agreement that defendants made and that, therefore, this is all that there possible was in the case, correct? [...] A I make -- I'm making no assumptions about whether she has found every document." Deposition of Margaret Guerin-Calvert, 17 September 2014, at 162:5 - 163:5.
- "Q. Is it possible that members of the alleged CRT cartel made additional price agreements that are not captured in Dr. Netz's data? A. Yes, it's possible." Deposition of Edward Snyder, 11 September 2014, at 197:10 - 13.
- "Q. Is it your understanding that Dr. Netz identified every target price agreement that was in the conspiracy? A. Not necessarily, and it's not necessary for my analysis." Deposition of Darrell Williams, 15 September 2014, at 263:12 - 16.
- "Q. You'll agree that it's possible that defendants set target prices that Dr. Netz simply did not find? A. I would imagine so. [...] Q. Well, it's possible that some evidence of target prices no longer exist, for example, the documents were destroyed or not retained. [...] THE WITNESS: Yeah. I mean, just common sense says who knows what's possible. I didn't look into that. [...] Q. What about the possibility that some target price agreements were made orally and that there's no written record of them? That's a possibility as well; true? THE WITNESS: Yeah. Again from the same point of view that I answered the last question; I have no particular reason to think that that was a likelihood, but nor could I rule it out as a matter of just plain logic." 19 September 2014, Deposition of Robert Willig, Ph.D., at 162:7 - 163:14.

[151] See Section VIII.A.3 of Netz Merits Report and Section V.A.

impact.[152] The relevant question is not whether there exist information exchanges that are not anticompetitive or even if *some* of Defendants' information exchanges were not anticompetitive but, rather, whether the information exchanges contributed to the overall effort to raise price above the competitive level. Defendants have explicitly acknowledged the anticompetitive nature of their exchanges as well as their efforts to hide the information exchanges as a result of their anticompetitive nature.[153]

While it is true that economists recognize that not all information exchanges between competitors are anticompetitive, it is also recognized that certain types of information are likely to have anticompetitive effects.[154] Exchanges of current or future (as opposed to historic) pricing or cost information, firm-specific (as opposed to aggregate) information, and direct exchanges between competitors (as opposed to a third-party, e.g., trade association) are considered to facilitate anticompetitive harm via collusion.[155] Meeting notes and deposition testimony establish exactly these characteristics.[156]

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[152] Snyder Opposition Report, at ¶¶86, 90, 105, 108, 113; Guerin-Calvert Opposition Report, at ¶54; and Willig Opposition Report, at ¶57.

[153] See, e.g.,

- An internal MTPD e-mail has the subject, "(Confidential) Thomson Mexicali Factory Information". The body text says, "Since this is in violation of antitrust, please do not leak it to others. Thomson production information. Sales figures obtained from the marketing unit at the Paris headquarters. It's the Marion A59 25V." The e-mail was forwarded to other MTPD employees in the U.S. with the warning "Please treat this as strictly confidential. It is information about the advancement of business." Kinoshita, Ayumu, 02 July 2003, E-mail, Subject: FW: (Confidential) Thomson Mexicali Factory Information, MTPD-0035375 - MTPD-0035376, at 5375E.
- From an internal Toshiba e-mail: "* Below, I ask you to destroy after reading * [paragraph] I am sure you are aware, but it is a fact that information exchange is being conducted occasionally among the three companies, Samsung, Orion and TAEC (TDD), regarding NAFTA's mid-size tubes. It is mainly general information, but since there are times that specific matters are discussed such as each's CPT supply proposals for each customer's (TV) planned production volume, as a result, the actual situation is that each Bulb store has considerably accurate understanding of information such as which customer is securing how much CPT for the set production volume." Yoshino, Michihiro, 24 January 2000, E-mail, Subject: Re: Destroy After Reading: GM Mizushima's complaint regarding Funai Electric's TDD 19v CPT Inquiry, TSB-CRT-00042440 - TSB-CRT-00042443, at 2440.
- From meeting notes: "The industry meetings should remain confidential in consideration of international antitrust laws". Shenzhen Samsung Display Device, 05 August 1999, The Chinese Industry Meeting (August), SDCRT-0086672 - SDCRT-0086674, at 6672E.
- See Netz Merits Report, p. 63 at footnote 205 for an extensive listing of documents demonstrating Cartel members understood that setting target prices was illegal attempted to conceal such their anticompetitive exchanges.

[154] See, e.g.,

- Federal Trade Commission and the U.S. Department of Justice, April 2000, Antitrust Guidelines for Collaborations Among Competitors.
- Delegation of the United States, 21 October 2010, Roundtable on Information Exchanges Between Competitors Under Competition Law, Compilation of OECD Competition of Policy Roundtables.

[155] See, e.g.,

Information exchanges are especially likely to be evidence of anticompetitive harm when there is supporting evidence of actual harm.[157] [redacted] In addition, as I explain in detail in Section VII, applying generally-accepted economic principles and methods to the facts and data from the case indicates that cartel conduct, which included information exchanges, resulted in higher CRT and CRT product prices.

F. Instances of cheating were not sufficient to render the cartel ineffective

- "Other things being equal, the sharing of information relating to price, output, costs, or strategic planning is more likely to raise competitive concern than the sharing of information relating to less competitively sensitive variables. Similarly, other things being equal, the sharing of information on current operating and future business plans is more likely to raise concerns than the sharing of historic information. Finally, other things being equal, the sharing of individual company data is more likely to raise concern than the sharing of aggregated data that does not permit recipients to identify individual firm data." Federal Trade Commission and the U.S. Department of Justice, April 2000, Antitrust Guidelines for Collaborations Among Competitors, at pp. 15-16.
- Delegation of the United States, 21 October 2010, Roundtable on Information Exchanges Between Competitors Under Competition Law, Compilation of OECD Competition of Policy Roundtables, at p. 296.

[156] For a list of examples see,

- Netz Merits Report, at pp. 26-30 and accompanying footnotes.
- Netz Merits Report, at 54 and footnote 185.

[157] Delegation of the United States, 21 October 2010, Roundtable on Information Exchanges Between Competitors Under Competition Law, Compilation of OECD Competition of Policy Roundtables, at p. 296.

[158] [redacted]

Defendants' experts assert that cheating was widespread, possibly so widespread as to render the cartel ineffective.[159] They also argue that a cartel needs effective punishment mechanisms to deter cheating.[160]

As a foundational matter, there seems to be some confusion as to whether cheating should have been a concern. Ms. Guerin-Calvert says "Differentiated and customized products also complicate punishment efforts since they make it more difficult for the cartel to take sales away from a perceived 'cheater,' thereby making cheating on the cartel more likely to be profitable."[161] This assertion is logically incoherent: if product differentiation limits co-conspirators from punishing cheaters because customers cannot easily switch away from cheaters, product differentiation would have likewise limited the cheaters ability to attract customers away from other suppliers. On the other hand, if product differentiation allows the cheater to steal sales by offering lower prices, the aggrieved co-conspirators can punish by offering punitive prices. Logically, either product differentiation limits cheating and punishment, in which case there is no need for punishment, or it does not limit cheating, in which case punishment is available to counter cheating.[162]

It appears that Ms. Guerin-Calvert made the same error made by Prof. Willig in his Class Certification Rebuttal Report: confusing the difficulty of physically substituting one CDT for another in an end-product with the question of economic substitution. As I described in my class certification report, competition among CRT manufacturers is at the design level: CRT manufacturers compete by convincing CRT finished goods manufacturers to use their tube in a given finished product design. Once the finished good design is finalized, the finished good manufacturer cannot readily switch to an alternative CRT *for that specific finished good model*.

The cartel eliminated competition not only during the design stage but also post-design-win. When a finished good manufacturer is in the design stage, the various CRTs available for the application and size desired are almost completely interchangeable – differences in electrical components, mounting points, the curvature where the tube and the bezel mate – are all open to change. After a finished product design has been finalized and a specific CRT has been chosen, the finished product manufacturer can cut back on production of one design in favor of a different design for the same size product. In this way, the finished good manufacturer can readily substitute between two physically incompatible CRTs from different manufacturers, simply by having two different designs of, for example, TVs using 21" CPTs from two different tube manufacturers.

When the correct question is addressed – whether different CRTs of a given size can be economic, rather than physical, substitutes, the answer is clearly affirmative. Thus, both cheating and punishment are possible.

As a second foundational issue, the existence of cheating – of producing more than the cartel agreed, charging prices lower than the cartel agreed, or presenting misleading information to the

[159] Guerin-Calvert Opposition Report, at ¶86; Willig Opposition Report at ¶59; Rubinfeld Opposition Report, at ¶¶43-53; and Snyder Opposition Report, at ¶157.

[160] Guerin-Calvert Opposition Report, at ¶22; Willig Opposition Report, at ¶27 (implicitly requiring a punishment mechanism); and Snyder Opposition Report, at ¶68.

[161] Guerin-Calvert Opposition Report, at ¶48.

[162] This is why economic models find that product differentiation may hinder or facilitate a cartel. See Section V.C.

cartel meetings – must not be confused with a competitive outcome. Observing a price below the agreed target price (or any other form of cheating) is not evidence that the observed price is a competitive price.[163] This point was succinctly put in a meeting between Chunghwa and Matsushita personnel:

> "Director Liu [Chunghwa] explained that although LG still has some under the table conduct, but being under the supervision by everyone, they are being pushed towards making most offer at the agreed bottom price"[164]

A competitive outcome occurs with the breakdown of the cartel – a situation where participation in the cartel provides no benefits to participants compared to non-participation. Basic economics tells us that firms are unlikely to invest the expensive time of their executives, let alone expose those executives to possible jail time and the firm to potentially massive fines, if the participation in the cartel meetings offered no benefit compared to non-participation. The continued participation of the firms is itself evidence that, regardless of the possible existence of cheating, the cartel had not broken down to the point where prices and output were at competitive levels. See Section V.B.

The Defendants' experts overstate the importance of cheating. Suslow and Levenstein, in a study of cartels cited by Defendants' experts, note "There are, however, numerous cartels for which cheating was an issue either intermittently or throughout the life of the cartel. Thus, for many of the cartels cheating was a fact of life – a reality of running the organization – but not a cause of death [of the cartel]."[165] Tellingly, they also note that cheating is often not punished; that cartels that frequently respond to cheating with punishment tend to be unstable.[166]

These empirical conclusions, in a study of many cartels, directly contradict the assertion by Ms. Guerin-Calvert that "we *would have expected* substantial punishments and/or side payments" in response to the deviations from target prices she claims exist.[167] Rather than being evidence of the cartel's failure, an ability to continue without punishments, despite imperfect adherence to cartel plans, is a hallmark of successful cartels.

Empirical economic research has also shown how cartels prevent breakdowns without punishment:

> "Cartels much prefer to develop the means to monitor each other's behavior in order to deter or physically prevent cheating, rather than resorting to expensive punishments such as price wars. Designing effective monitoring mechanisms takes place over time as cartels learn about both their competitors and their customers, and then refine the organizational structure to provide the necessary incentives and information to sustain cooperation. For example,

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[163] See Section VI.A.1.

[164] CPT, Liu, et al., 25 August 1998, Sales Department Customer Contact Report, CHU00028463 - CHU00028464, at 8464E.

[165] In their study of 81 cartels, only 6 broke up primarily due to cheating. Levenstein, Margaret C. and Valerie Suslow, May 2011, Breaking up is Hard to Do: Determinants of Cartel Duration, Journal of Law and Economics, 54(2), 455 - 492, at p. 470.

[166] Levenstein, Margaret C., Suslow, Valerie Y., May 2011, Breaking up is Hard to Do: Determinants of Cartel Duration, Journal of Law and Economics, 54(2), 455 - 492, at p. 485.

[167] Guerin-Calvert Opposition Report, at ¶71, emphasis added.

> successful cartels will often develop a hierarchy, separating high-level policy decisions made by executives from the more frequent ongoing monitoring and negotiations undertaken by lower-level managers."[168]

Not surprisingly, we observe exactly this approach to cheating in the successful and effective CRT cartel. I described the hierarchical structure of the cartel meetings in my previous reports.[169] The cartel had specific methods within its structure to address allegations of cheating.[170] In line with the approach cartels generally have to cheating (as described above by Suslow and Levenstein), the cartel primarily used discussion and public shaming (public within the context of cartel meetings, rather than in a broader, general-public, sense) to address cheating.[171] That is not to say the cartel never threatened each other with retaliation, they did.[172] On at least one

[168] Levenstein, Margaret C. and Valerie Y. Suslow, 2006, What Determines Cartel Success?, Journal of Economic Literature, Vol. XLIV, 43-95, at p. 44.

[169] See Netz Class Cert Report, at section VIII.A.2.a); Netz Class Cert Rebuttal at section VII.B.2.b)(5); Netz Merits Report at VIII.A.3.a).

[170] See, e.g.,

- "President Lin indicated that after the Top Level reached a conclusion regarding the price issue, the Working Level personnel should actually Review the market price situation at each meeting, and if abnormality appears, then they should find out the real price. The saboteur will be questioned thoroughly. The matter will then be reviewed at the Top meeting to seek a solution." Hsieh, Chun-Mei (Christina), 13 October 1999, Contact Report, Meeting Topic: CDT Regular Exchange Meeting, CHU00030888 - CHU00030893, at 0890.01E.
- "In response to the above statements [about SDD Shenzen maintaining high output and low prices], [SDD Senior VP] Mr. INN Kim indicated that he: 'did not know before that', but only heard about this rumor just now. He would investigate and find out the truth himself. Hopefully others would give him some time. If proved to be true upon investigation, it will be corrected. If each maker still faces the above situation at the next high level meeting, then everybody can discuss how to respond. It's okay even if the conclusion is to Shut Down SDD(Shenzhen)." Chunghwa Picture Tubes, LTD, 26 January 1999, Contact Report, CHU00030701 - CHU00030704, at 0702.01E.

[171] [redacted]

[172] See, e.g.,

occasion, a cartel member threatened to address cheating in the CRT cartel with punishment in the cartelized LCD market.[173] The evidence of "cheating" discussed by Defendants' experts amount to little more than the ordinary, day-to-day functioning of a cartel, in line with what current economic theory and empirical research lead us to expect.

Ms. Guerin-Calvert's and Defendants' other experts' claims that Defendants' behavior was inconsistent with that of a "successful cartel" suggests that successful cartels behave in accordance with simple textbook economic models rather than the more complicated reality described in empirical studies of real-world cartels.

Defendants' experts claim that a successful cartel would experience little cheating and when cheating did occur, it would be punished. They claim that a successful cartel would keep prices from falling over time, prevent output and production capacity from increasing over time, and maintain constant market shares among members.[174]

This is an outdated understanding of how cartels work and is inconsistent with modern economic theory and empirical studies of real world cartels:[175]

> "Following Stigler (1964), many economists have argued that such attempts [to collude] would inevitably fail as colluding firms succumbed to the temptation to shave prices secretly in order to increase their individual firm profits. Subsequent theoretical work has established that sufficiently patient and well informed firms can, in principle, collectively deter cheating and allow collusion to survive. But the empirical question remains: Do firms manage to deter cheating? Does collusion survive? If so, for how long? If not, why not? What impact do cartels have on profits and prices while they are in existence? What impact do they have on industry structure after their demise?"[176]

- "I said that if SDD [Samsung] insisted, then competition was bound to happen. CPT [Chunghwa] would have to respond with countermeasures. PH [Philips] said that there should be differences between the large and small ones. Only then, SDD reluctantly said that it would check and see to the best of its ability." Chunghwa Picture Tubes, LTD, 12 March 1997, Contact Report, CHU00028755 - CHU00028756, at 8755.02E.
- "If HEDS [Hitachi] still insists on price competition, then the Major 5 will have Serious Countermeasure." Chunghwa Picture Tubes, LTD, 25 October 2000, Visit Report, CHU00031075 - CHU00031087, at 1076.02E.
- "Mr. Garbi [employee of LPD] reinforced that we [Samsung] must not disturb them into [sic] Panasonic and in case it happens they will strongly drop the prices at Semp Toshiba just in order to cause some damage to us." Samsung, 16 June 2005, Meeting Report, SDCRT-0091855 - SDCRT-0092657, at 1859.

[173] "In the event that other companies reduce their [CDT] prices to grab the market share, we will stop LCD supplies to AOC (currently supplies [90~100K]) and will offer the supplies to other customers at low price to hurt the market." Samsung SDI, 23 February 2004, Report on DMM meeting results, SDCRT-0090253 - SDCRT-0090254, at 0253E.

[174] I discuss these claims directly in Section VI.

[175] Dean Snyder acknowledges this new strand of literature; Deposition of Edward Snyder, 11 September 2014, at 261:10-19.

[176] Levenstein, Margaret C. and Valerie Y. Suslow, 2006, What Determines Cartel Success?, Journal of Economic Literature, Vol. XLIV, 43-95, at p. 44.

This suggests that successful cartels react to changing economic conditions by developing sophisticated organizations, developing trust, and constantly renegotiating their collusive agreements as they learn what works and what doesn't. To be sure, the incentive to cheat on price and output agreements exists, but this does not necessarily make successful cartelization impossible, especially when it gives rise to the kind of behavior Defendants engaged in: establishing a complex hierarchy of meetings, frequent communication of sensitive market information, fixing target prices, restricting output, allocating customers, developing trust, ensuring compliance via monitoring and credibly threatening noncompliant members.

Defense experts also assert that CRT pricing was complex and opaque, making it difficult for cartel members to distinguish cheating from fluctuations in demand.[177] As a basic matter, this assertion is difficult to reconcile with the documents they cite as showing complaints about cheating: the complaints indicate cartel members believed they had detected cheating. Cartel members indicated they were able to determine the prices offered by competitors.[178] The ability of the cartel to detect deviations from the cartel agreements is not surprising, given the evidence above that products were far more standardized than Defendants' experts claimed.[179]

Additionally, recognizing that overall output reductions equate to supracompetitive prices, the cartel had systems for monitoring output.[180] They also used their influence to prevent non-cartel members from growing output in a manner that would threaten the cartel's pricing.[181]

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[177] Guerin-Calvert Opposition Report, at ¶44 and Willig Opposition Report, at ¶¶25-27.

Prof. Willig states that, while unaffiliated finished good manufacturers might reveal one tube vendors prices to another tube vendor, the finished good manufacturing arms of the vertically integrated tube manufacturers would not have incentives to reveal cheating that took the form of reduced internal transfer prices. Willig Opposition Report, at ¶29, footnote 36. This claim does not make economic sense. A vertically integrated finished good firm must do three things to hide low prices on its internal tube purchases: it must not reveal the lower internal tube prices to external tube vendors, it must continue to purchase from external tube suppliers at cartel prices, and it must not reduce the prices of the finished goods made with the low-priced internal tubes. Failing to do any of these would reveal the cheating. But doing all three means that the lower internal transfer prices are meaningless – they have no effect on the market or on the integrated firm's profits; they merely change which division of the vertically integrated firms records the cartel profit.

[178] See, e.g.,

- Chunghwa claimed "they have seen reliable proof from customers" regarding Samsung's pricing. Chunghwa Picture Tubes, LTD, 18 August 1997, Visitation Report, Major Content: Exchange of Market Information, CHU00028701 - CHU00028703, at 8702E.
- Shao'R stated that PHS's [Philips] orders had been low and determined that SDDD [sic, Samsung] had definitely yielded to one of its customers on absolute price and/or PAYMENT TERMs. CDT, 08 January 1999, China CDT MAKER Contact Meeting, CHU00030695 - CHU00030697, at 0697.01E.
- "CPT intends to counter using a tactic of small volume and low price in transactions with LGE, and thereby pry out LPD's [Handwritten: 'Intra-group'] actual prices and restrict its conduct of damaging market prices." Samsung SDI, 24 November 2004, CDT Market Report, CHU00578887 - CHU00578894, at 8887.02E.
- "Mr. Kim also claims that there are No Confidentiality on current market, SDD has its channel of Information." Du, Ching-Yuan (Michael), 21 August 1996, Customer Contact Report, CHU00028803 - CHU00028804, at 8803.02E - 8804E.

[179] See Section V.C.3.

[180] Netz Merits Report, at 55-58.

VI. Empirical evidence is consistent with an effective cartel

In the previous sections, I explained why Defendants' experts' claims have not changed my conclusion that Defendants' conduct was consistent with their goal of collectively raising CDT and CPT prices above competitive levels. In this section I explain why Defendants' experts' claims have not changed my conclusion that the data indicate that Defendants succeed in raising prices. I start by discussing the empirical analysis that directly shows the impact of one type of conduct the cartel engaged in – setting target prices for some CRTs – leads to higher prices of CRTs. I then discuss the empirical evidence offered by Defendants' experts. I explain why their comparisons and conclusions are logically flawed, and that when considered in context of the facts of the CRT industry and cartel, the empirical evidence is consistent with the operation of an effective cartel.

A. The cartel's target prices impacted Defendants' actual prices

As described in Section V.A, the cartel used a variety of methods to raise price above the competitive level. One of those methods – the setting of target prices – is quantifiable and therefore lends itself to empirical analysis. In one of those analyses, I showed that the target prices set by the cartel impacted the actual CRT prices charged by the cartel, for both CRTs that had and did not have a target price.

1. The fact that some actual prices were below target prices is irrelevant

Ms. Guerin-Calvert, Prof. Rubinfeld, Dr. Williams, and Prof. Willig all argue that Defendants sometimes set prices below target prices and that this is inconsistent with my conclusion that Defendants successfully raised prices above the competitive level.[182]

The fact that some actual prices were below target prices does not mean that Defendants set prices at the competitive level. It only indicates that Defendants did not raise prices as high as they wanted. See Section V.F.

The proper way to evaluate the effectiveness of the cartel is to compare actual prices with what the prices would have been if Defendants had competed instead of colluding to raise prices. Accordingly, a simple comparison of target and actual prices is irrelevant to the question of how successful cartel members were at raising prices.

2. Regression analysis shows that target prices caused actual prices to be higher

[181] "In addition, it is forecasted that Glass supply will face a Shortage next year. Everyone should work diligently to pressure the Glass Vendors not to supply Glass to those second tier makers [Rainbow, Samtel and Ekranas], so that they would not be not able to have enough Glass to ruin the market pricing." Chunghwa Picture Tubes, LTD, 27 November 1998, Visitation Report (Submit), CHU00029259 - CHU00029261, at 9259.01E.

[182] See, e.g.,

- Guerin-Calvert Opposition report, at ¶¶70-73.
- Rubinfeld Opposition report, at ¶¶54-55.
- Williams Opposition report, at ¶¶118-128.
- Willig Opposition report, at ¶¶35-36.

In my previous report, I presented a series of regression analyses that showed target prices predict actual prices of CDTs and CPTs for which I was able to find a matching target price. That is, all else equal, higher target prices led to Defendants setting higher actual prices for those CRTs.

This relationship also holds for CDTs and CPTs for which I was unable to find a matching target price. To assess this relationship, I created an index of CDT target prices and another for CPT prices.[183] I presented regression results that showed these target price indices predict the actual prices of CDTs and CPTs for which I was unable to find a matching target price. That is, all else equal, higher target prices led to Defendants setting higher actual prices for all CRTs. This is exactly the relationship that one would expect if Defendants succeeded in raising prices.

Prof. Willig, Ms. Guerin-Calvert, and Dean Snyder each criticize my methodology and present alternate target price regression analyses. Defendants' experts' versions of target price regressions are unreliable and biased toward finding that target prices have no effect even when there is a direct causal effect. Furthermore, Defendants' experts mischaracterize the result of their own (improperly specified) analyses, which are in fact perfectly consistent with Defendants' successfully raising prices for all CRTs. None of their claims alters my conclusion or the approach to my target price regression analysis.

3. Prof. Willig's and Ms. Guerin-Calvert's target price regressions also show target prices caused actual prices

Prof. Willig and Ms. Guerin-Calvert both claim that if cartel members adhered to target prices then *changes* in target prices should predict *changes* in actual prices.[184]

Both perform regressions that are similar to my target price regressions. The most important difference is that Defendants' regressions are run in first-differences (quarterly changes in prices) as opposed to levels, as in my regressions. Below, I explain the importance of this distinction and why analysis in first-differences is improper.

a) Prof. Willig's and Ms. Guerin-Calvert's regressions prove the opposite of what they claim; target prices led to higher actual prices

Both Prof. Willig's and Ms. Guerin-Calvert's regressions show that changes in target prices predict changes in actual prices.[185] This relationship is statistically significant and its magnitude is economically meaningful. They argue that their results indicate that the cartel was not very effective, e.g., Prof. Willig says a 5% increase in target price is associated with a 1.06% change in actual price and Ms. Guerin-Calvert says that a 1% increase in the target price is associated with a 0.24% increase in actual price.[186] Even if their results were correct (they are not, because they improperly used first-differences in the regressions), the results indicate that the cartel successfully raised price by about 20-25% of its goal. Prof. Willig's and Ms. Guerin-Calvert's regressions, even taken at face value, prove exactly the opposite of the point they claim.

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[183] An index is used as a measure of "average" target prices. Unlike a simple average, it controls for changes in the types of tubes made in different periods.

[184] Willig Opposition Report, at ¶38 and Guerin-Calvert Opposition Report, at ¶73.

[185] Willig Opposition Report, at ¶43 and Exhibit 8 and Guerin-Calvert Opposition Report, at ¶75 and Table 4.

[186] Willig Opposition Report, at ¶43 and Guerin-Calvert Opposition Report ¶75.

Prof. Willig claims that his results do not imply that changes in target prices caused changes in actual CPT prices because both prices are likely affected by common market factors.[187] However, when he controls for changes in market conditions (as I did in my target price regressions) he still finds that target price changes predict changes in actual prices and this relationship is statistically significant and its magnitude is economically meaningful.[188]

Prof. Willig also presented separate regressions for large and small CPTs.[189] The regressions were also conducted in first-differences. The results of the regression for small CPTs were consistent with the regressions for all CPTs; they show that changes in target prices for small CPTs predict changes in the actual prices. This relationship is statistically significant and its magnitude is economically meaningful.

The regression results for large CPTs show that changes in target price for large CPTs do not have a statistically significant impact on actual prices. Prof. Willig claims that this is evidence that "even if the alleged cartel were effective at elevating the prices of some CPTs at some points in time, the effect was likely much smaller – possibly zero – for large CPTs than for small CPTs."[190] However, as I explain below, target price regressions should be performed using price levels, not price changes. When I perform the regressions for small and large CPTs using price levels, I find that target prices predict actual prices of both small and large CPTs and that these relationships are both statistically significant and economically meaningful. See Exhibits RR-92 and RR-93.

b) Defendants' experts' criticism of analysis in price levels is wrong

Prof. Willig and Ms. Guerin-Calvert both claim that the analysis in first-differences is better than the analysis in levels.

Prof. Willig claims that a regression using price changes is a more direct test of Defendants' adherence to target prices.[191] This makes no sense; Defendants set target prices and actual prices in dollar levels,[192] and any "direct test" of their conduct would be conducted in levels.

Prof. Willig also argues that a regression in first-differences is appropriate because target and actual prices should both be higher for, say, a 29" CPT than for a 21" CPT, and first-differencing the price data controls for this.[193] He may be correct that some CRTs have higher target and actual prices because they are bigger or higher quality, and that this might cause an improperly

[187] Willig Opposition Report, at ¶43.

[188] Willig Opposition Report, at ¶43 and Exhibit 8.

[189] Willig Opposition Report, at ¶45 and Exhibit 8.

[190] Willig Opposition Report, at ¶45.

[191] "I compare actual and claimed target price changes because such a comparison is a direct test of putative cartel members' adherence to target prices. To be effective in an environment where prices are declining, a cartel would have to guard against overly aggressive price decreases by cartel members who could use such price cuts to gain sales at the expense of other cartel members. The logic of Dr. Netz's cartel theory implies that the alleged CPT cartel used newly announced target prices as a mechanism to set limits to price decreases. As such, if the alleged cartel were, in fact, effective and its members adhered to target prices, then they would have changed their sales prices in compliance with changes in announced target prices." Willig Opposition Report, at footnote 49.

[192] See Target price-structure.xlsx in my backup materials.

[193] Willig Opposition Report, at footnote 49.

specified regression to find a relationship between target and actual prices where one did not exist. However, he ignores the fact that I control for this possibility by including appropriate regressors.[194]

Prof. Willig and Ms. Guerin-Calvert claim that my analysis of price levels is problematic because target and actual prices are affected by the same market forces that caused prices to generally trend downward over time.[195] My regression controls for changing supply and demand conditions including macroeconomic factors and the cost of glass. Prof. Willig admits that it is possible to directly control for changing market conditions as I have done, although he says it's difficult.[196] Similarly, Ms. Guerin-Calvert concedes that I directly control for factors that affect supply and demand but claims that I have failed to control for some unspecified "relevant market forces".[197] Neither expert points to specific market conditions for which I have failed to account.

Both Prof. Willig and Ms. Guerin-Calvert ignore the fact that I control for unobserved market forces that affect actual prices. I do this by including the previous period's actual price in the regression, thus mitigating the "spurious correlation" problem to which Ms. Guerin-Calvert refers.[198] Ms. Guerin-Calvert acknowledged in her deposition that including a lagged dependent variable can mitigate the problem of spurious regression.[199]

c) Analysis in first-differences biases the regression results toward finding no relationship between target and actual prices

Defendants' experts perform their target price regressions in first-differences. This exacerbates econometric problems related to random variation, or noise, in the data which can obscure the true impact that target prices have on actual prices.

In practice, virtually all large sales datasets contain some errors and this is true of Defendants' data in this case.[200] This is a fact of life for econometricians and is typically not an insurmountable problem.

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[194] Econometricians call unobserved differences between products "unobserved heterogeneity" and have devised several methods of controlling for it. I use a method called "fixed effects estimation" while Defendants' experts use a method called "first-differences estimation". Both methods correct the problem of unobserved heterogeneity but first-differences estimation causes other problems (see below) which make it unsuitable for this particular application. Wooldridge, Jeffrey M., 2002, Econometric Analysis of Cross Section and Panel Data, The MIT Press: Massachusetts, at pp. 265-267.

[195] Willig Opposition Report at footnote 49 and Guerin-Calvert Opposition Report, at ¶79.

[196] Willig Opposition Report, at footnote 49.

[197] Guerin-Calvert Opposition Report, at ¶79.

[198] Granger and Newbold state that the "usual recommendations are to either include a lagged dependent variable [as I have done] or take first differences of the variables involved in the equation [like Defendants' experts did]". Granger, C.W.J. and P. Newbold, 1974, Spurious Regression in Econometrics, Journal of Econometrics, Vol 2, 111-120, at p. 117.

[199] Guerin-Calvert Deposition, at 178:17-20.

[200] Sources of noise in the data include Defendants' data entry errors and Defendants' different methods of treating rebates and discounts. Another source is the lack of complete information on CRT characteristics. Given the incomplete information, several CRTs may be used to calculate a single average price, and that price may fluctuate due to changes in the mix of CRTs over time. This can affect actual prices and target prices.

When the target price regressions are performed in levels, the noise in the data is small relative to the actual and target prices. However, the noise in the data is amplified when one analyzes the data in first-differences rather than levels. The increase in noise obscures the relationship between target and actual prices.

For example, suppose that the "true" target and actual prices are about $50 and that they are trending downward by approximately $1 each quarter. Now suppose that the data we observe is not the "true" values of the target and actual prices but includes a small amount of "noise" on the order of $0.50, or about 1% of the true prices. If one runs a regression on the price levels, because the noise in the data (about $0.50) is only about 1% of the price levels (about $50), this doesn't present much of a problem to estimation. Intuitively, because the noise is small relative to the price, it is relatively easy to discern the relationship between target and actual prices.

But if one runs a regression on the price changes, then the noise ($0.50) is 50% of the quarterly change in prices ($1). When the noise is this large relative to the data used in a regression, the true relationship between target and actual prices is likely to be obscured.

To further illustrate how the effects of a small amount of noise in the data are exaggerated by applying first-differences to the data, I simulated a dataset containing target and actual prices. The simulated target prices decline by 2% each quarter plus or minus a random noise term. The simulated actual prices are equal to the target prices plus or minus another random noise term. Because of the way that I have defined the data, actual prices are a direct function of the "true" target prices. Thus in these data, there is a causal relationship between target and actual prices.

Exhibit RR-94 plots the levels of the simulated target and actual prices over time. The two series clearly move together and seldom deviate by very much. In contrast, Exhibit RR-95 plots the changes in the simulated target and actual prices in the same style as Prof. Willig and Ms.Guerin-Calvert did in their reports.[201] In first-differences, there is no longer a clear relationship between target and actual prices; it has been completely obscured by the random errors, despite the fact that there is a causal relationship between target and actual prices in these data and that the errors in the data are relatively small.

These simulated data are only included as an illustration of one problem associated with first-difference estimation. I do not base any of my conclusions on the simulated data nor do I claim that the simulated data represent the Defendant data.

It is well-understood that analysis in first-differences makes the problem of noisy data worse than if the data are analyzed using the fixed effects approach I employ.[202] Furthermore, as I explained in Section VI.A.3.b) my estimation approach affords the same benefits as the first-difference estimation approach.[203]

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[201] Guerin-Calvert Opposition Report, Figure 20; Willig Opposition Report, Exhibit 7.

[202] The first-difference estimation approach used by Defendants' experts exacerbates the problem of attenuation bias to a greater degree than fixed effects estimation approach that I employ. Griliches, Zvi and Jerry A. Hausman, 1986, Errors in Variables in Panel Data, Journal of Econometrics, Vol. 31, 93-118, at p. 95.

[203] My regressions are run using price levels and used the fixed effects estimator, which provides the same benefit of eliminating the impact of unobserved time-invariant heterogeneity across different CRTs without inducing a problem with noise in the data. I also include the previous period's actual price in the regression, which mitigates the problem of "spurious regression".

Defendants' arguments in favor of the first-differences specification are not supported by economic or econometric theory. The target price regressions should be performed in levels. Performing the regressions in first-differences adds nothing to the analysis and artificially obscures the relationship between target and actual prices.

d) Ms. Guerin-Calvert's interpretation of target price regressions is unreasonable

Ms. Guerin-Calvert claims that my regressions only demonstrate a correlation between target and actual prices and not a causal effect. She claims that the relationship in the data may be due to Defendants' forecasting ability. That is, when Defendants set target prices they had some idea what actual prices would be in the following months and the target prices reflect that information. According to Ms. Guerin-Calvert, when Defendants actually sold CDTs over the following months, the only reason those prices were correlated with the target prices was because the cartel was good at forecasting what prices would be.[204]

This is not a reasonable interpretation of the regression results. To see why, consider the following analogy made by Ms. Guerin-Calvert. She says that macroeconomic models may predict future GDP movements but that doesn't mean the model causes the movements in GDP.[205] She claims that this is similar to how Defendants set target prices (forecasts), which then had no impact on actual prices.

The results of a regression analysis should be interpreted in the context of the available facts. It's a fact that a macroeconomic model cannot cause GDP to move. Any correlation between a GDP model and subsequent movements in GDP should be attributed to good forecasting. Conversely, it's a fact that Defendants had control over both target and actual prices. Not only that, the Defendants' stated intent in setting target prices was to affect the actual prices that they would set in the coming months. It simply makes more sense to attribute the predictive relationship between target and actual prices to Defendants' conduct than some unspecified market conditions for which I have not controlled. The facts indicate that the most reasonable interpretation of the regression results is that Defendants' target prices served their intended purpose by causing Defendants to set higher prices.

e) Prof. Willig's and Ms. Guerin-Calvert's claims concerning target price predictive accuracy are wrong

Prof. Willig presented another regression which he claims shows that "alleged target prices, expressed in the same functional form as that Dr. Netz's analysis", are poor predictors of actual CPT price levels.[206] Ms. Guerin-Calvert presented a similar analysis for CDTs.[207]

Prof. Willig's claim that he uses "the same functional form as in Dr. Netz's analysis" when evaluating the predictive accuracy of target prices is wrong. The model he presents is completely different from my model. In a footnote he clarifies that his model is a regression of actual prices on target prices and *does not include any of the other variables included in my regression*. He

[204] Guerin-Calvert Opposition Report, at ¶81.

[205] Guerin-Calvert Opposition Report, at ¶81.

[206] Willig Opposition Report, at ¶¶51-52 and Exhibits 10-11.

[207] Guerin-Calvert Opposition Report, at ¶82.

justifies this choice by saying "if the alleged cartel members adhered uniformly to the alleged target prices, then target prices alone should be able to accurately predict actual prices". When Defendants set their actual prices, they had full knowledge of prior prices and supply and demand conditions in addition to the target prices. They would not have had complete information about future supply and demand conditions when they set the target price. Since the underlying information on which Defendants based prices was different for targets versus actual prices, any model of prices should include as controls all of the information available to Defendants when they set their actual prices.

I do not claim that Defendants adhered *uniformly* to target prices, and whether they did so or not is irrelevant to the question of whether they raised prices above the competitive level. Defendants could have successfully raised prices above the competitive level without adhering uniformly to target prices. The predictive accuracy of Prof. Willig's and Ms. Guerin-Calvert's oversimplified models is irrelevant to the question of whether target prices caused actual prices to be higher.

4. Dean Snyder misinterprets his target price regression results

Dean Snyder also presents a regression that analyzes the relationship between changes in target prices and changes in actual prices.[208] As I explain in Section VI.A.3.c), analyzing price changes is inappropriate and a proper analysis should examine the relationship between target and actual price levels.

Dean Snyder's regression analysis is different from the other Defense experts' analyses. He limits his regression to Toshiba's data and changes the specification of his regression model. He regressed the change in actual prices on an indicator variable for CRTs with a matched target price, the change in glass cost, the change in an index of consumer electronic sales, and the change in the Yen/U.S. Dollar exchange rate. He finds that the coefficient on the indicator variable is zero. He claims this means target prices had no effect on actual prices.

Dean Snyder misinterprets the results of his own regression. Instead of supporting his conclusion that target prices have no effect on actual prices, his regression actually indicates that CRTs with matched target prices are priced similarly to CRTs for which I was unable to identify a target price. Dean Snyder's results can be explained as showing either that the target prices moved *none* of Toshiba's prices or that the target prices moved *all* of Toshiba's prices. Because of the way he chose to specify his regression, it is incapable of distinguishing between these two possibilities. To the extent that the results mean anything at all, they are fully consistent with an inference that all of Toshiba's prices were impacted. Dean Snyder agreed with this interpretation in his deposition.[209] In light of the considerable evidence that the cartel frequently succeeded in raising prices, the more reasonable interpretation of Dean Snyder's results is that all of Toshiba's prices were impacted by Defendants' conduct.

5. The cartel's target prices impacted sales to North American purchasers

Prof. Willig presented a regression analysis of the impact of changes in Defendants' target prices on changes in the actual prices paid by North American direct purchasers. His analysis is

[208] See Snyder Opposition report, at ¶¶154-156 and Exhibit 14.

[209] Deposition of Edward Snyder, 11 September 2014, at 241:15-23.

performed in first-differences, which is improper. As I explain in Section VI.A.3.c), such an analysis should be performed on price levels, not price changes. I have corrected Prof. Willig's regressions to estimate the impact of target price levels on actual prices paid by North American purchasers. See Exhibit RR-96. Defendants' target prices exhibit an economically meaningful and statistically significant impact on the prices paid by North American direct purchasers. These results are similar to the results of my regressions assessing the impact of target prices on worldwide CPT prices presented in my previous report.[210] In fact, the effect of target prices on the prices paid by North American purchasers is stronger than the effect on prices worldwide, as reflected in the larger coefficient estimate in the regression on North American sales.

I also performed a regression that estimates the effect of an index[211] of target prices on the level of actual prices paid by North American purchasers for CPTs that I was unable to match to a specific target price. See Exhibit RR-97. The index of Defendants' target prices exhibits an economically meaningful and statistically significant impact on the prices paid by North American direct purchasers for CRTs that I was unable to match to a specific target price. These results are also similar to the results of regressions assessing the impact on worldwide CPT prices that I presented in my previous report.[212] The effect of the target price index on actual prices paid by North American purchasers is stronger than the effect on prices worldwide, as reflected in the larger coefficient estimate in the regression on North American sales.

Together, these results indicate that the cartel effectively raised prices to all North American purchasers, regardless of whether there is a record of Defendants setting target prices for a particular sale.

B. Trends in output, capacity, prices, and market shares over time do not indicate that the cartel was ineffective

Several Defense experts claim to identify trends in CRT output, capacity, prices, and market shares over time that are inconsistent with successful collusion.[213] They claim that output and capacity increased while prices fell, either industry-wide or for a particular Defendant, and that market shares of individual Defendants changed over time. They argue that members of a successful cartel would not increase output or capacity and cut prices over time and that shifting market shares are incompatible with a successful cartel. Defendants' experts are wrong.

There is no theoretical basis for their claims. Even if Defendants' experts are correct in claiming that output or capacity increased or that prices fell and Defendants' market shares changed over

[210] Netz Merits Report Section, at VIII.A.4.a and Exhibit 38.

[211] I used a Fisher price index, which is a method of calculating average prices that accounts for changes in the composition of target prices over time.

[212] Netz Merits Report, at Sections VIII.A.4.b.3 and Exhibit 45.

[213] See, e.g.,

- Guerin-Calvert Opposition Report, at ¶¶55-64, 87-98.
- Willig Opposition Report, at ¶¶62-67.
- Williams, at ¶¶75-80, 154-157.
- Snyder Opposition Report, at ¶¶131-141, ¶158.
- Rubinfeld Opposition Report, at ¶¶12, 56-60.

time, all of these facts are consistent with the presence of a successful cartel. Simply examining trends in output, capacity, price, and market shares over time provides no economic basis for concluding that Defendants were unsuccessful in restricting output and raising prices above the competitive level.

In addition, Defendants' experts have failed to control for changes in determinants of output, capacity, price, and market share other than the cartel. The optimal levels of output, capacity, and price for a successful cartel would only be stable over time if the economic environment failed to change over time. Members of a profit-maximizing cartel will respond to changing market conditions by changing output, capacity, and prices. That does not mean that prices are as low or that output is as high as they would be in the but-for world. It simply reflects the fact that profit-maximizing cartel members will respond optimally to changing economic conditions. For example, cartel members might cut prices because of improved production technology (which effectively decreases production costs) and increase output in response to a surge in demand. In fact, production technology did generally improve during the cartel period and, for a time at least, demand for CDTs surged as computer sales soared in the mid-1990s.[214]

The same flaw applies to the claim that a successful cartel would have stable market shares: that prediction is based on an underlying assumption that all else is held constant.[215] In particular, predictions of stable shares across cartel members over time assume the cartels' market demand and relative costs of supply are unchanging. Defendants' experts agree that market conditions were changing; e.g., Defendants' experts called the CRT market "dynamic" and characterized by "shifts in the identities and profiles of CRT manufacturers".[216]

Similarly, Defendants' experts recognize that the various firms had differentiated strategies and sold differentiated products. For example, they report that some firms, primarily the Japanese vendors, focused on high-quality, high-end CDTs relative to other firms.[217] If the Japanese firms were focused on the high-quality, high-end of the market while Samsung, Chunghwa, and LG focused on the mass market, I would expect Samsung, Chunghwa, and LG to benefit more from the explosive growth of home and general-business computers over 1995-2000. This would result in Samsung, Chunghwa, and LG growing more quickly than the Japanese manufacturers, which would likely be experiencing lower growth rates in their chosen niches.[218] Such a pattern would see market shares changing over time, even if Samsung, Chunghwa, LG, and the Japanese were not competing for customers. For example, Ms. Guerin-Calvert reports that Sony's share

[214] See Snyder Opposition Report, at ¶¶62, 67 and Guerin-Calvert Opposition Report, at ¶¶61, 63.

[215] Even if all else were equal, Defendants' experts' claim of stable market shares is too rigid. For example, the Harrington article cited by Dean Snyder (Snyder Opposition Report, footnote 142) says "the best collusive equilibrium may have market shares moving over time as firms achieve a more efficient mechanism in which a firm with lower cost has a higher market share." Harrington Jr., Joseph E., "Detecting Cartels," in Buccirossi, Paolo ed., Handbook of Antitrust Economics, The MIT Press, Cambridge, 2008, at p. 245.

[216] Guerin-Calvert Opposition Report, at ¶¶26-29 and Snyder Opposition Report, at ¶54.

[217] See, e.g., Guerin-Calvert Opposition Report, at footnote 68 and 220 and Snyder Opposition Report, at ¶44, internal citations omitted.

[218] For example, engineers would have already been using high-end monitors, so the sales growth to them would be a replacement or organic growth rate (based on the growth rate of engineers).

of 17" CDTs declined 10% between 1996 and 2000; she fails to note that Sony's output of those products increased 63% over the period.[219]

The high-end strategy the experts attribute to the Japanese also explains their early exit from CDT production relative to Samsung, Chunghwa, and LG: the high-end market, accustomed to high prices for monitors, would have been the first to move to LCD monitors.

Dr. Williams and Dean Snyder claim cartel capacity should grow more slowly than non-cartel capacity and present evidence purporting to show it did not. The argument fails on both theoretical and factual grounds.

Some economic models predict that cartel capacity should grow more slowly than non-cartel capacity, all else equal. However, if the non-cartel capacity and cartel capacity address different market segments, economic theory offers no predictions about their relative capacity growth rates. There is no theoretical expectation that demand or cost conditions, and changes in those conditions, are the same for all market segments. If one segment of the market is growing differently from the overall market, or experiencing different changes in its cost structure, there is no reason to expect capacity or output growth in that segment to match the overall market.

This issue affects the manufacturers to which Dr. Williams and Dean Snyder compare Defendants. For example, Sony, as noted by other defense experts (see text above) focused on the high-end, high-quality niche and JCT was a small producer in India, a market isolated by protectionist barriers.[220] Similarly, if producers have different costs, economic theory provides no useful predictions about cartel and non-cartel producer capacity or output over time unless one accounts for the differences in costs.

Dr. Williams' claim, that we expect a cartel to grow output or capacity more slowly than non-cartel output or capacity, is a theoretical prediction about the cartel, not about individual firms or plants within the cartel. To claim this theoretical prediction applies specifically to Panasonic requires an implicit assumption that cartel member market shares must be perfectly stable over time - that is, that changes in overall cartel output or capacity (the subject of the theoretical claim) will be exactly reflected in changes at a specific cartel member (the subject of his empirical analysis). As described above, there is no theoretical or empirical basis for claiming that we should expect stable market shares within the CRT cartel. Dr. Williams present no additional evidence to support this necessary assumption, meaning there is no theoretical expectation about how Panasonic's output or capacity should change relative to the output or capacity of either the entirety of non-cartel members or any individual non-cartel firm.

Dr. Williams' results do not generalize to other non-cartel members. He compared Panasonic to JCT, a small firm within the protected Indian market. Another non-cartel firm is Novel, a significantly larger firm than JCT manufacturing small and medium CPT in China, from which finished small and medium TVs enter the global market. Novel's output increased from 3.48

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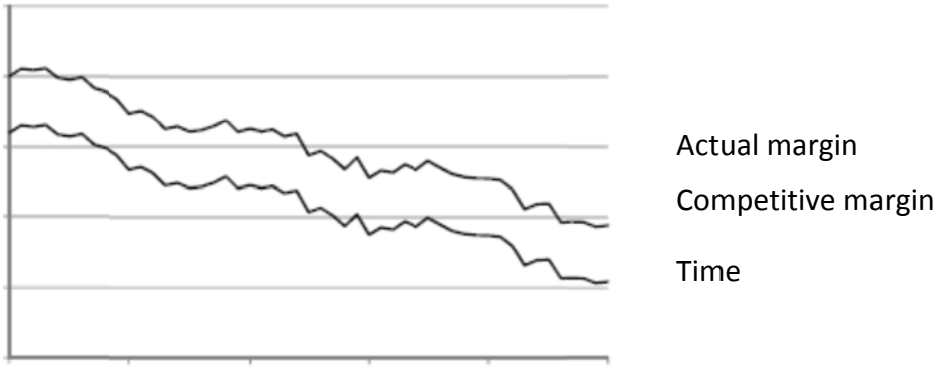
[219] Sony 10% drop in share: Guerin-Calvert Opposition Report, at Figure 3. According to the source underlying Ms. Guerin-Calvert's Figure 3 (Samsung, 11 December 2003, Worldwide CDT Manufacturer's Status, SDCRT-0201291.), Sony produced 2,550,000 17" CDT in 1996 and 4,149,000 17" CDT in 2000, an increase of 62.7%.

[220] In 1999, "India's CRT import tariff is still as high as 40%." Du, Ching-Yuan (Michael), Hsieh, et al., 25 November 1999, Contact Report, CHU00029163 - CHU00029170, at 9164.01E. Six years later, an LPD analysis cites India as an example of a protected market. Vaartjes, Wiebo, 26 September 2005, Email: competitive analysis, LPD-NL00140679 - LPD-NL00140692, at 0686.

million tubes in 1998 to 5.77 million in 2002, a 13.5% CAGR, a growth rate substantially higher than the 0.2% CAGR Dr. Williams reports for Panasonic.[221]

C. Declining profit margins over time are consistent with an effective cartel

Both Ms. Guerin-Calvert and Prof. Willig attempt to show that the cartel was ineffective by presenting evidence of declining margins; their evidence cannot support that conclusion because margins that decline over time are consistent with the existence of an effective cartel. An effective cartel is one which causes prices to be higher than they would otherwise be, absent the cartel's anticompetitive conduct; generally, margins are higher, too. A higher than competitive margin is consistent with a margin that falls over time, as illustrated in the following chart illustrates:[222]



This circumstance is not only possible, in an industry experiencing secular decline in demand and excess capacity, such as CRTs, it is to be expected when that industry is cartelized. Absent price fixing, competition in such circumstances can become "ruinous".[223] Cartel members themselves recognized that their industry was in secular decline[224] and that, but for the cartel, would have engaged in "ruinous" competition.[225] Falling margins are not only consistent with an effective cartel, they can be an incentive to form a cartel.

Ms. Guerin-Calvert's commentary on the facts is consistent with mine: she says that the observed margins are consistent with non-collusive conduct, and I show that the observed margins are consistent with an effective cartel. Taken together, our claims are consistent with the statement "the existence of a declining margin does not tell us anything about whether the cartel was effective".

Prof. Willig goes further than Ms. Guerin-Calvert; he asserts that "[a] successful CPT cartel would have elevated the profit margins of its participants". This is a true statement if the margins were elevated relative to what they would have been absent collusion. Looking only at collusive margins cannot tell you if profit margins were elevated relative to but-for profit margins. The conclusion Prof. Willig reaches cannot be supported by the evidence he presents because his

[221] Williams Opposition Report, at ¶75 and Exhibit C-1.

[222] Netz Class Cert Report has a similar chart and discussion on p. 7.

[223] Guerin-Calvert Opposition Report, at ¶132 and Willig Opposition Report, at ¶¶64-65.

[224] Netz Merits Report, at 21.

[225] Netz Merits Report, at 21.

conclusion is based on the false premise that falling margins are inconsistent with an effective cartel.[226]

D. Panasonic's prices are consistent with participation in the cartel

Dr. Williams claims Panasonic's and MTPD's CRT prices were not highly correlated with other Defendants' prices and that this indicates Panasonic's and MTPD's prices were not determined in concert with other Defendants' prices.[227] This claim is at odds with basic economic theory, which predicts that Panasonic's and MTPD's prices should be correlated with other Defendants' prices whether they participated in the cartel or not. Dr. Williams acknowledges this when he argues that even if Panasonic's and MTPD's prices were similar to other Defendants' prices, that would not necessarily indicate that they participated in the cartel because non-participants have an incentive to set prices just below that of the cartel.[228] In any event, Dr. Williams' correlations are calculated improperly.

Dr. Williams calculates average prices for various size categories of CPTs and CDTs separately for Panasonic, MTPD, and other Defendants. For example, he calculates the average price for medium CPTs produced by MTPD. He then calculates the correlation between the firms within a particular size category; for example, the correlation between MTPD's and other Defendants' prices for medium CPTs.

The problem with this approach is that the various size categories include different types of CRTs with varying prices; e.g., a particular size category would include sales of flat and round CRTs.[229] To the extent that the mix of CRTs in a given group changes from month to month the average price will also change, even if the price of every CRT remained constant.[230] Because of this flaw in his calculations, Williams' correlations do not accurately measure how closely Panasonic's and MTPD's prices track the prices charged by other Defendants.

I corrected Dr. Williams' calculations to account for changes in the mix of products over time by employing a Fisher Price index.[231] This is a method of calculating average prices that accounts

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[226] Prof. Willig acknowledged at his deposition that changes in margins over time may be due to "other things .. going on … in the marketplace", and that declining margin "alone is not a dispositive fact" regarding cartel effectiveness. Deposition of Robert Willig, 19 September 2014, at 236:8-23.

[227] Williams Opposition Report, at ¶¶84-86, 129-130, 149 and Exhibits 11, 25, 34.

[228] Williams Opposition Report, at ¶15.

[229] I implement some analyses without taking into account the shape or other characteristics of CRTs. I do this when the data are not sufficient to incorporate adjustments for other characteristics and when that simplification does not bias the analysis in a way favorable to Plaintiffs. Neither is true for the analysis Dr. Williams is attempting.

[230] For example, if Panasonic sold two different small CDTs, one at a high price and one at a low price, then an increase one month in the number of high price CDTs sold would make the average sale price increase even if the prices of the individual CPTs were both constant.

[231] I calculate separate monthly Fisher price indices for CDTs and for CPTs sold by each Defendant in Dr. Williams' exhibits. For Panasonic and MTPD, I use only U.S. price data. I make two changes relative to Dr. Williams' approach, both of which are conservative because they make it less likely that I would find a strong correlation between Panasonic's or MTPD's prices and other Defendants' prices. I use worldwide price data for other Defendants and I do not calculate separate price indices for different size groups (e.g., small, medium, and large CPTs). Both changes allow me to use more data to calculate the correlations because some month-size group-Defendant combinations have no data. Using worldwide price data for other Defendants is conservative because worldwide prices may be less correlated with U.S. prices if market conditions in the U.S. differed materially from

for the change over time of the products that are sold.[232] I then use these price indices to calculate the correlation between Panasonic's and MTPD's prices and the prices charged by other Defendants.

Exhibit RR-98 presents the results. Unlike Dr. Williams' correlations, most of the pairwise correlations in my analysis are large and statistically significant, indicating that Panasonic's and MTPD's prices track other Defendants' prices.

VII. The evidence supports my finding that the cartel caused overcharges of 22% and 9% for CDTs and CPTs, respectively

The facts and the data of the case described in my original report formed the basis for my opinion that the cartel did *in fact* impose overcharges on class members.[233] My overcharge model is limited to estimating a reasonable quantification of class-wide damages. Specifically, using the widely-accepted regression analysis method I analyzed all usable Defendant-produced sales data from before, during, and after the cartel with additional data to control for non-cartel factors and obtained a reasonable measure of the amount by which the cartel increased CRT prices over what they would have been absent collusion. I then multiplied the cartel-imposed overcharge rate by the pass-through rate and the revenues received by Defendants and Co-conspirators from sales to class members.

As detailed in my expert report, I combined generally-accepted economic principles and methods to the facts and data from the case to obtain my overcharge estimate.[234] Moreover, I subjected my results to standard statistical tests and sensitivity checks in addition to considering their reasonableness in light of the documentary evidence.[235]

Defendants have filed a number of reports opposing my overcharge model and conclusions. In particular, Ms. Guerin-Calvert opposes the reliability of my CDT overcharge estimates,[236] and Prof. Willig opposes my CPT overcharge estimates.[237] In addition, although Dr. Howell does not address the validity of my cartel overcharge model generally, she makes assertions regarding its ability to estimate manufacturer-specific overcharges.[238,239]

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the rest of the world, as Defendants' experts claim. Calculating a single price index for each Defendant instead is conservative because prices of CRTs within a size group may be more highly correlated with each other than with prices of CRTs in other size groups.

[232] Willig Opposition Report, at footnote 12 and Ordover Opposition Report, at footnote 19. Ms. Guerin-Calvert does not describe a Fisher Price Index, but she uses the concept frequently in her Opposition Report, at Figures 1, 11, 12, 13, 30, and 32.

[233] See, especially Netz Merits Report, at Section VIII.

[234] Netz Merits Report, at Section IX, pp. 96-103.

[235] Netz Merits Report, at Exhibit 65.

[236] Guerin-Calvert Opposition Report, at Section IV.

[237] Willig Opposition Report, at Sections VII, VIII, and IX.

[238] Howell, Vandy, 05 August 2014, Expert Report of Vandy Howell, Ph.D., In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Howell Opposition Report").

Below I demonstrate that Defendants' experts' arguments overlook documentary evidence I cited in making my modeling decisions; neglect statistical tests and sensitivity analyses I reported in my merits report; and use their altered versions of my model to answer questions other than that for which I developed the overcharge model in my merits report. I also explain how Ms. Guerin-Calvert and Prof. Willig make invalid arguments about the consistency of my results and my conclusions. Specifically, Ms. Guerin-Calvert and Prof. Willig introduce false premises by mischaracterizing their own altered versions of my model as "Dr. Netz's model" and assessing my conclusions against their models' results.[240]

A. My overcharge estimates are consistent with my claim of class-wide impact

Ms. Guerin-Calvert and Prof. Willig argue that *my own* analyses undermine my claim of class-wide impact.[241] However, both alter the model I used in my merits report.[242] In particular, they change the cartel period variable – the main variable of interest in the overcharge model.[243] They then use results from *their* altered models as the basis to claim that *my* analysis is inconsistent with my class-wide impact claim. Results from Ms. Guerin-Calvert and Prof. Willig's models, which implement different cartel variables, do not provide an appropriate basis for assertions regarding the consistency between my conclusions reached from my model's results.

B. My estimate of the overcharge is based on the data available

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[239] Dr. Williams uses my overcharge model for another purpose. I discuss that issue below. Williams, Darrell, 05 August 2014, Expert Report of Dr. Darrell Williams, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Williams Opposition Report").

[240] See, e.g.,

- "making no change to her analysis other than just unbundling small CPTs from large CPTs reveals that Dr. Netz's model estimates…"Willig Opposition Report, at ¶71.
- "Making no change to her analysis other than just unbundling the alleged cartel period such that her model is used to estimate potential CPT overcharges for each year of the alleged cartel activity reveals that Dr. Netz's model estimates…" Willig Opposition Report, at ¶73.

Likewise, Ms. Guerin-Calvert assesses the consistency of my claims and my model on the basis of comparing my claims to estimates she gets:

- "if we only add additional indicator variables to Dr. Netz's model…" Guerin-Calvert Opposition Report, at ¶114.
- "if we replace the Netz conspiracy variable with annual indicator variables for each year…" Guerin-Calvert Opposition Report, at ¶114.

[241] Guerin-Calvert Opposition Report, at Section IV.A. and Willig Opposition Report, at Sections VII.A-B.

[242] Guerin-Calvert Opposition Report, at 73, ¶¶112-114 and Willig Opposition Report, at ¶¶71 and 73.

[243] More specifically, in one version Ms. Guerin-Calvert inserts two additional dummy variables, one for each of 1995 and 1996; in another version she inserts individual dummy variables for each year from 1995 through 2007. Guerin-Calvert Opposition Report, at ¶¶112-113 and Table 6.

Prof. Willig also adds individual dummy variables for each year from 1995 through 2007. Willig Opposition Report, at ¶¶73-74 and Exhibit 13.

Ms. Guerin-Calvert and Prof. Willig do not present case evidence supporting annualized cartel periods.

I described the data that were available and that I used to calculate the overcharge in my Merits Report. The biggest source of data for the overcharge analysis was Defendants. As I stated: "Data produced in response to these requests have been incomplete, with some Defendants failing to provide any data whatsoever.[footnote omitted] Data that were produced vary by Defendant in terms of time periods covered and production facilities included."[244]

Ms. Guerin-Calvert claims that "Dr. Netz also ignores the fact that the dataset she uses to estimate overcharges is missing sales data for many manufacturers and time periods."[245] In fact I did what I could – I looked for alternative sources of data, I asked counsel to pursue discovery from Defendants, and I evaluated the sufficiency of the data to form the foundation for the overcharge calculation. I would have used data that is missing for some firms and some time periods if it had been available.

In contrast to Ms. Guerin-Calvert, Prof. Willig instead throws out some of the data. Specifically, he breaks my benchmark period, which combines information from both the pre- and post-cartel period, into two separate periods and then throws out the nine quarters of pre-cartel period data and compares the results to when he throws out the thirteen quarters of post-cartel period data.[246] To justify this analysis, Prof. Willig cites to an econometric text that states that if changes occur in an industry, "then a regression model that neglects those changes can provide a misleading basis for inference and forecasting".[247] The estimated relationships in my cartel overcharge model *incorporate*, not "neglect", changes within the data period as they are based on data from the entire data period.

C. Case evidence is the basis of my overcharge model

Prior to formulating my cartel overcharge model, I reviewed the available CRT sales data and provided my reasoning for deeming the data sufficient – though incomplete relative to what were requested – to provide a reasonable measure of the cartel overcharges.[248]

After reviewing the case evidence – including documented evidence that information exchanges began as early as February 1995 and continued through at least late 2007 – I selected 1995 through 2007 as the cartel period.[249] Additionally, I split the cartel period into two sub-periods to account for various global competition agencies' actions which may have impacted the cartel's operation and effectiveness.[250] Recent empirical academic work supports the reasoning that competition agency investigations impact cartel effects.[251] Ms. Guerin-Calvert and Prof. Willig do not dispute that the agencies took such actions or my reasoning that such actions could impact the cartel effectiveness.

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[244] Netz Merits Report, at 100-101.

[245] Guerin-Calvert Opposition Report, at ¶129.

[246] Willig Opposition Report, at ¶¶89-90.

[247] Willig Opposition Report, at ¶87.

[248] Netz Merits Report, at 101.

[249] Netz Merits Report, at 99.

[250] Netz Merits Report, at 99-100.

[251] Clark, Robert and Jean-Francois Houde, June 2014, The Effect of Explicit Communication on Pricing: Evidence from the Collapse of a Gasoline Cartel, The Journal of Industrial Economics, Vol. LXII, No. 2, 191-228.

Ms. Guerin-Calvert and Prof. Willig do not present case evidence or reasoning supporting annualized cartel periods. Prof. Willig cites to an ABA treatise that says estimating overcharges for various sub-periods "may" provide a more accurate estimate of overcharges "for specific class members".[252] This authority does not support using an arbitrary division of the overcharge into years, nor does it suggest such a division improves the accuracy of estimating classwide damages.

I also used case evidence and industry facts when determining reasonable control variables – which account for non-cartel related CRT pricing factors – for my cartel-overcharge model.[253] In particular, I used controls for supply factors – including CRT glass prices; and demand factors – including unemployment and other display technologies. I also included a flexible time trend to control for the influence of trends in CRT prices over time not otherwise captured by the model's supply and demand variables.[254]

My overcharge model is fit to the facts and data of the case.

D. Case evidence supports cartel overcharges throughout 1995-2007

Ms. Guerin-Calvert and Prof. Willig both make the claim that my model estimates positive and statistically significant results for 1995 and 1996 but that for other years my model finds small or negative overcharges.[255] This is simply false; my model does not estimate annual overcharges.[256]

Ms. Guerin-Calvert and Prof. Willig also assert that the evidence does not support positive overcharges in 1995 and 1996. However, the positive overcharges Ms. Guerin-Calvert's and Prof. Willig's models estimate in 1995 and 1996 are supported by the record evidence. For example, as documented in my Merits Report, early 1995 meeting notes demonstrate cartel members were engaging in information exchanges in that time frame.[257] Exhibit RR-85 documents a multitude of cartel meetings and communications from 1995 and 1996.

Additionally, deposition testimony establishes that the meetings allowed cartel members to more slowly decrease prices and more quickly increase prices in response to industry conditions than they would have absent the exchanges.[258]

This case evidence undermines Ms. Guerin-Calvert's and Prof. Willig's claims that changes in industry conditions in 1995 and 1996 caused higher prices rather than the cartel. In fact, changes

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[252] Willig Opposition Report, at footnote 80.

[253] Netz Merits Report, at 102-103.

[254] Netz Merits Report, at 103.

[255] Guerin-Calvert Opposition Report, at ¶112 and Willig Opposition Report, at ¶73.

[256] My model does, however, include variables to control for, among other factors, changes in CRT prices over time. Netz Merits Report, at 104.

[257] Notes from a 1995 meeting show that communication regarding price increases had occurred or was planned with "all CPT/CDT Makers in Thailand, Malaysia and Singapore". Chunghwa Picture Tubes, LTD, 29 May 1995, CPT Sales & Marketing Division Visiting Report, CHU00028933- CHU00028945, at 8933.01E.

[258] "Q. Do you agree, Mr. Liu, that in times of over-supply these group competitor meetings helped keep prices from falling as much as they would have? [Objections omitted.] A. Agree." "Q. And when there was a shortage of tubes, sir, do you agree that these group competitor meetings allowed suppliers to raise prices faster? [Objections omitted.] A. Agreed." Deposition of Chih Chun-Liu, Vol. II, 20 February 2013, at 364-365.

in industry conditions provided opportunities for cartel members to price differently than they would have absent coordination. In particular, Ms. Guerin-Calvert and Prof. Willig both claim the glass shortages in 1995 and 1996 are the explanation for their high estimated overcharges in those years relative to later years.[259] My model includes CRT glass prices for each year, including 1995 and 1996, in order to isolate the cartel price effect from changes in glass prices. Furthermore, Dean Snyder claims that there was a glass shortage in 1998 but Ms. Guerin-Calvert and Prof. Willig both assert low overcharge estimates after 1996.[260] If glass shortages were the cause of higher overcharge estimates in 1995 and 1996 that were not sufficiently captured by the inclusion of a glass price index, then Ms. Guerin-Calvert and Prof. Willig should have found high overcharges in 1998 as well.

Ms. Guerin-Calvert and Prof. Willig also base their claims regarding 1995 and 1996 cartel overcharges on the amount of target price coverage in 1995 and 1996.[261] Target price evidence, which the participants explicitly tried to keep secret, is not the extent of the cartel evidence available; see Section V. As I explained in my merits report, I considered the full-body of evidence when determining the cartel period, including notes on meetings and other information exchanges.[262]

Ms. Guerin-Calvert also claims that my "assumption that the 1995-1996 price movements were caused by the alleged conspiracy also is inconsistent with the opinions of DAP Plaintiff Dell's expert Dr. Mohan Rao."[263] As an initial matter, I did not assume that any price movements were caused by the conspiracy; I reviewed the record evidence and drew appropriate conclusions. I also did not use the overcharge model as a basis for concluding that the cartel was able to raise price above the competitive level – I used it to obtain a reasonable estimate of the cartel imposed overcharge.

Further, I understand that Dr. Rao submitted an expert report for Dell in this matter alleging cartel overcharges on Dell.[264] This is a different question, involving different plaintiffs, than the question I investigated. Additionally, Dr. Rao did not "conclude[] that it would be inappropriate" to include 1995 and 1996 in the cartel period.[265] As the quote Ms. Guerin-Calvert cites in her report explicitly indicates, Dr. Rao stated that there would be "challenges" to doing so.[266] He also explained that his modeling decision was influenced in part by the lack of significant Dell sales

[259] Guerin-Calvert Opposition Report, at ¶118 and Willig Opposition Report, at ¶76.

[260] Snyder Opposition Report, at ¶¶63-64.

[261] Guerin-Calvert Opposition Report , at ¶116 and Willig Opposition Report, at ¶75.

[262] Netz Merits Report, at 99.

[263] Guerin-Calvert Opposition Report, at ¶120.

[264] Dr. Rao's assignment was "to calculate the overcharges paid by Dell on its direct purchases of CRT monitors". Rao, Mohan, 15 April 2014, Expter Report of Mohan Rao, Ph.D, Dell Inc., et al. v. Hitachi, Ltd. (United States District Court Northern District of California San Francisco Division) (Hereinafter "Rao Merits Report"), at 3.

[265] "Dr. Rao was the only one of the Plaintiffs' experts to explicitly address the unique market conditions during this time period, and he concluded it would be inappropriate to assume that the alleged conspiracy accounted for the behavior of CDT prices in 1995 and 1996." Guerin-Calvert Opposition Report, at ¶120.

[266] Guerin-Calvert Opposition Report, at ¶120.

prior to 1997.[267] In contrast, I have obtained usable sales data beginning in 1993.[268] Dr. Rao also acknowledged case evidence that "information exchanges among the defendants began at least as early as 1995" .[269]

Dr. Rao was seeking to answer a different question, for a different plaintiff, using different data and never offered an opinion that including 1995 and 1995 in the cartel period was inappropriate.

Documentary and quantitative case evidence supports cartel overcharges throughout the damages period, including 1995 and 1996.

Prof. Willig also claims that my CPT overcharges undermine my claim that the cartel had class-wide impact in part on his premise "just unbundling small CPTs from large CPTs" causes my model to estimate a 3.9% overcharge.[270] Prof. Willig arrives at this figure by dropping all observations on CPTs smaller than 26 inches. I did not exclude observations on CPTs smaller than 26 inches; I included all usable data. Even accepting Prof. Willig's positive and economically significant 3.9% overcharge estimate on large CPTs does not contradict a claim that the cartel had class-wide impact. Prof. Willig points out that his 3.9% overcharge estimate is not statistically different from zero.[271] As Prof. Willig acknowledged at his deposition, the manner in which he split up the data could have been a factor in the results not being statistically significant.[272] Whether an estimate is statistically significant or not does not impinge on whether it is economically significant nor does it change the fact that given the data and model Prof. Willig used, the best estimate of the overcharge is 3.9%.

Moreover, my model isolates the price effects of size from the cartel's impact in a number of ways. For one, my model has variables for each CRT-glass price and size combination; this allows changes in CRT glass prices to impact CRT prices differently depending on the size.[273] Since demand for CRT glass drives CRT glass prices and demand for CRT glass is derived directly from demand for CRTs, these interaction variables control for the possibility that, for example, alternative display technologies affect the demand – and hence price – for CPTs differently for different sizes.[274] Further, I include dummy variables for each manufacturer and size; these variables not only account for price variation by size, but also allow the premium for one size versus another to vary between manufacturers.

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[267] "In addition, Dell's purchases of CRT monitors, according to its purchase records, were relatively small prior to 1997. These factors also provide reasonable support for a damages model that does not extend to a period prior to 1997." Rao Merits Report, at ¶22.

[268] Netz Merits Report, at 101.

[269] Rao Merits Report, at ¶53.

[270] Willig Opposition Report, at ¶71.

[271] Willig Opposition Report, at footnote 79.

[272] Deposition of Robert Willig, Ph.D., at 245:12 - 246:13.

[273] These are the (glass and size) and (glass and size-squared) interaction terms in my model. Netz Merits Report, at 104.

[274] In fact, by including a term interacting glass prices with a squared size variable, I also allow the differential effect of glass prices on CRT prices to itself vary by size. For example, the effect of glass prices on CRT prices is allowed to vary between 14" and 15" CRTs differently than it is between 20" and 21" CRTs

I have presented evidence that large CPTs were cartelized in Section V. I estimate my cartel overcharge model using data that include large CPT prices and the overcharge coefficient is statistically and economically significant. The documentary and case evidence supports cartel overcharges on large CPTs.

E. My overcharge model is reliable

Ms. Guerin-Calvert and Prof. Willig argue that my overcharge model is unreliable. To support this assertion Ms. Guerin-Calvert cites to academic literature that econometric models should be robust to small changes.[275] Similarly, Prof. Willig questions the reliability of my dummy variable model on the basis of academic literature highlighting the well-known fact that, like every other empirical model, the dummy variable approach incorporates assumptions and these should be taken into consideration.[276]

I agree that sensitivity analyses, along with consideration of the underlying theory and other evidence, are an important type of information when evaluating empirical work. I documented the sensitivity analyses and the resulting range of overcharge estimates I performed in Exhibit 65 of my merits report. Despite pointing out that such analyses are pertinent for judging estimation results, neither Ms. Guerin-Calvert nor Prof. Willig opposed or otherwise discussed these sensitivity analyses.[277]

Likewise, I agree with the reference Prof. Willig quotes that the dummy variable approach should "not be made without substantial thought." I explained my reasoning for implementing the dummy variable in my merits report.[278] Further, when read in full, the cited paragraph does not undermine the reliability of the dummy variable approach. Instead, the conclusion from the paragraph is that when prices are determined in complex ways the dummy variable approach and forecasting approach are likely to generate different estimates.[279] Again, I explained in my merits report why, given the available data, I deem the dummy variable model to be appropriate.

Finally, the reference paragraph states (in part) that "If prices are determined in rather complex ways, the use of a single dummy variable that will reflect mean differences between the benchmark and but-for periods may be too simplistic."[280] I did not use a single cartel-period dummy variable.

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[275] Guerin-Calvert Opposition Report, at footnote 177.

[276] Willig Opposition Report, at ¶88.

[277] Dean Snyder uses an alteration in lag structure as a sensitivity analyses; this is one of the sensitivity tests I reported in Exhibit 65. Snyder Opposition Report, at footnote 175.

[278] Netz Merits Report, at. 96-101.

[279] "If prices are determined in rather complex ways, the use of a single dummy variable, that will reflect mean differences between the benchmark and but-for periods may be too simplistic. In particular, if one or more of the explanatory variables in the model is correlated with the dummy variable, then the dummy variable and forecasting approaches are likely to generate different damages estimates." Rubinfeld, Daniel L., 2008, Quantitative Methods in Antitrust, Competition Law and Policy, Issue 1, ABA Section of Antitrust Law, 723-742, at p. 740.

[280] Willig Opposition Report, at ¶88.

Furthermore, I evaluated the reasonableness of my overcharge estimate in the context of other case evidence and economic theory.[281] Defendants' experts also do not oppose or otherwise discuss these considerations.

As explained my merits report, my cartel overcharge model includes variables capturing CRT supply and demand factors to isolate the price-effect of the cartel.[282] In particular, although defendant-specific cost data sufficient for regression analysis have not been produced, I included a CRT glass price index.[283] Case evidence indicates that glass comprises a significant portion of the manufacturing cost of CPTs and CDTs.[284] Moreover, CRT glass demand derives from demand for CRT products – changes in CRT product demand will be reflected in changes CRT glass prices.

In contrast to Ms. Guerin-Calvert and Prof. Willig's claims that I do not have sufficient controls in my model the variables I included in my overcharge model explain over 95% of CDT price variation and over 98% of CPT price variation.[285]

Prof. Willig claims that the Bank of Korea glass price index is unlikely to reflect global glass costs.[286] To support his claim Prof. Willig points out that the Bank of Korea CRT glass prices do not always correlate with Japanese scientific instrument glass, Japanese float glass (used, e.g., in windows), and U.S. blown glass. It is not surprising that differences may exist between the Korean CRT glass index and the non-CRT glass indices Prof. Willig considered. That is not evidence against the claim that Korean CRT glass prices were likely to be correlated with other global CRT glass prices.[287]

I note that Defendants' expert Dean Snyder also identifies glass as a significant part of the CRT unit price and uses the Bank of Korea glass index to measure CRT glass prices in his analyses.[288]

Ms. Guerin-Calvert and Prof. Willig identified different proxy variables they assert more appropriately control for relevant CRT market factors. Specifically, they suggest adding worldwide desktop computer shipments (for CDTs); the Baltic Dry Goods Shipping Index; the Korean Labor rate; the Korean Won-U.S.-dollar exchange rate; and sales in U.S. electronics retail stores (for CPTs).[289,290]

There are a number of alternative indices that proxy for the same types of information as the variables Ms. Guerin-Calvert and Prof. Willig suggest. For example, fuel is a component of both

[281] Netz Merits Report, at 105.

[282] Netz Merits Report, at 102-103.

[283] Netz Merits Report, at 103.

[284] Netz Merits Report, at 102.

[285] Exhibit RR-99 provides the unadjusted and adjusted R-squareds.

[286] Willig Opposition Report, at footnote 86.

[287] See Willig Opposition Report, at footnote 108.

[288] Snyder Opposition Report, ¶¶63-64.

[289] Guerin-Calvert Opposition Report, at ¶¶124-125 and Willig Opposition Report, at ¶100.

[290] Ms. Guerin-Calvert mistakenly asserts that the Korean glass prices are in won when in fact I converted the index to U.S. prices. Guerin-Calvert Opposition Report, at ¶125.

shipping costs and production (energy) costs and so would be relevant even to CRTs produced in North America and that don't involve ocean shipping, whereas Prof. Willig testified that the Baltic shipping index he used would be irrelevant to these tubes.[291] He also acknowledged that he is not sure what is in the U.S. electronics store variable he used but thinks it includes refrigerators and other non-CRT related home appliances.[292] Exhibit RR-99 shows that cartel-imposed overcharges remain positive and significant after adding the fuel index as well as the control variables suggested by Ms. Guerin-Calvert and Prof. Willig. Including the suggested variables does not explain meaningfully more price variation than the model I estimated.[293]

F. 22.0% and 9.0% are reasonable measures of the direct overcharge imposed on CDTs and CPTs, respectively

Although the Defendants' cartelization of the CRT industry makes it impossible to observe the prices that would have resulted in a competitive CRT market, economists have developed a number of research methods to use observable information to estimate outcomes in such unobservable but-for worlds.[294] The approach I followed in my Merits Report entailed combining generally-accepted economic principles and methods to the facts and data from the case. I also conducted statistical tests and sensitivity analyses as well as evaluated the results in light of the qualitative evidence.

The arguments in Defendants' Experts' Opposition Reports rely on false premises, faulty reasoning, and irrelevant claims that do not undermine the reasonableness of the approach, model, data, results, or conclusions I presented in my Merits Report.

I conclude that 22.0% and 9.0% are reasonable measures of the direct overcharge imposed on CDTs and CPTs, respectively.

G. Case evidence supports an overcharge to North American purchasers

Defendants' experts argue that Defendants' collusive actions did not have an impact on prices in North America or that the impact there differed from the impact in other parts of the world.[295] I

[291] Deposition of Robert Willig, 19 September 2014, at 277:8-277:24.

[292] Deposition of Robert Willig, 19 September 2014, at 286:6-286:21.

[293] The adjusted R^2 statistics for the CDT and CPT overcharge models I reported in my merits report were 0.952 and 0.986, respectively. In contrast, the adjusted R^2 statistics from CDT and CPT models that also include the control variables suggested by Ms. Guerin-Calvert and Prof. Willig are equal to 0.965 and 0.987. Given that the adjusted R^2 statistic ranges between zero and one, these are very slight differences. For calculations, see "adjusted r2 comparisons.txt" from my backup.

[294] Netz Merits Report, at 96-97 and footnote 283.

[295] See, e.g.,

- Rubinfeld Opposition Report, at ¶¶67-90.
- Williams Opposition Report, at ¶¶28-36, 41, 47-54, 140-143.
- Willig Opposition Report, at ¶¶96-98.
- Wu Opposition Report, at ¶¶67-84.

have already documented evidence and provided reasoning for my conclusion that the cartel's impact applied to tubes sold to class members.[296] Section VI.A.5.

Prof. Willig is the only expert to attempt an empirical analysis of the impact to purchasers located in North America.[297] The others simply argue that the cartel could not have had an impact as a matter of theory. Contrary to these theoretical arguments, documentary evidence establishes that cartel members were aware of international – including North American – antitrust implications of their conduct.[298]

Prof. Willig identified Defendants' sales to North American purchasers and used these data to generate an estimate of the cartel overcharge specific to North American purchasers.[299] Prof. Willig's estimate of the overcharge indicates that North American prices were, on average, 5.14% higher during the cartel period than they would have been in the but-for world.[300] By itself, Prof. Willig's estimate is evidence that Defendants' conduct had an impact on North American purchasers. Further, Prof. Willig's North American overcharge estimate is statistically indistinguishable from the worldwide estimate of 8.94% presented in my previous report.[301] My estimates of the worldwide CPT overcharge are based on significantly more data, which means they are more reliable and precise than Prof. Willig's estimates of the overcharge paid by North American purchasers.[302]

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[296]Netz Merits Report, see especially Section VIII.A.5: The cartel's price-fixing impacted the U.S., at pp. 72-81.

[297] Willig Opposition Report, at ¶98.

[298] See, e.g.,

- An internal MTPD e-mail has the subject, "(Confidential) Thomson Mexicali Factory Information". The body text says, "Since this is in violation of antitrust, please do not leak it to others. Thomson production information. Sales figures obtained from the marketing unit at the Paris headquarters. It's the Marion A59 25V." The e-mail was forwarded to other MTPD employees in the U.S. with the warning "Please treat this as strictly confidential. It is information about the advancement of business." Kinoshita, Ayumu, 02 July 2003, E-mail, Subject: FW: (Confidential) Thomson Mexicali Factory Information, MTPD-0035375 - MTPD-0035376, at 5375E.
- From meeting notes: "The industry meetings should remain confidential in consideration of international antitrust laws". Shenzhen Samsung Display Device, 05 August 1999, The Chinese Industry Meeting (August), SDCRT-0086672 - SDCRT-0086674, at 6672E.
- "Large size price trend: 25V $102-103 (major customer, bottom price standard) Based on North America antitrust law, CRT companies are not to discuss prices with each other, but in my opinion it appears to be a price we heard from Philips [return] Price gap between 25v and 27V: Tube (ITC standard) around $35, set retail standard $40-50." Im, Chul Hong, 12 January 1999, North America CPT companies meeting summary, SDCRT-0002526 - SDCRT-0002528, at 2528E.

[299] Willig Opposition Report, at ¶98.

[300] Willig Opposition Report, at ¶98.

[301] See "test nafta significance.txt" in my backup for calculations. Prof. Willig's 5.14% estimate is a weighted average of the two cartel sub-period estimates; I have reported the weighted average CPT overcharge from my previous report (8.94%) for comparison purposes.

[302] My worldwide overcharge estimates incorporate data from all sources while Prof. Willig is forced to discard a substantial amount of data from his NAFTA overcharge estimates because the data have incomplete customer location information. As a result, my worldwide CPT overcharge estimates are based on 2,574 observations, while Prof. Willig's NAFTA estimates are based on only 1,314 observations. My estimates are based on roughly twice as many data points as Prof. Willig's.

H. Case evidence supports Hitachi overcharges

Dr. Howell claims to assess my model's ability to identify and measure Hitachi specific overcharges.[303] Not only does Dr. Howell not use my model in her estimate, her approach is inapplicable to CDTs because of its reliance on only Hitachi data for the but-for world.[304] And, while her approach allows her to estimate a Hitachi specific CPT overcharge, her estimate is based on nine Hitachi observations from the before period; these nine total observations are for three different CPT sizes.[305]

My approach allows me to use all usable defendant data when estimating the cartel overcharge.[306] By using all available data, I am able to estimate the cartel overcharge for both CDTs and CPTs. Hitachi sales data are included in the data used to estimate the cartel overcharges and my model includes manufacturer specific identifiers to control for manufacturer-specific price effects.

Dr. Howell did not evaluate how her results fit in with the rest of the case evidence. In fact, she did not evaluate any produced documents or data outside of the transaction data.[307] This is not good statistical practice.[308] Case evidence establishes that Hitachi participated in the cartel. See Exhibit RR-88.

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[303] Howell Opposition Report, at ¶4.

[304] Dr. Howell changed my model by adding "interactions between all control variables with a dummy variable for the Hitachi Defendants." Howell Opposition Report, at footnote 7.

[305] See, e.g,

- Howell Opposition Report, at p. 9, Notes to Table 2.
- 18 September 2014, Deposition of Vandy Howell, Ph.D., at p. 21:17-21:21.

In fact, by including Hitachi interactions for all control variables, Dr. Howell is effectively throwing out all non-Hitachi data for any of her Hitachi-specific estimates. That is, one could obtain the exact same estimates as Dr. Howell by dropping all non-Hitachi data instead of implementing a Hitachi interaction for all control variables.

[306] Netz Merits Report, at 104.

[307] "Q. The only document you reviewed in this case was -- for this report that you've relied upon was HDP-CRT00018516? A. Yes.Q. And that's Hitachi's transactional data? A. Yes.Q. And there were no other documents produced in the litigation that you relied on in forming your opinion for Dr. McClave's report? A. Not to do these tests, no. Q. And is that the same document you relied on for Dr. Netz's report? A. Yes." 18 September 2014, Deposition of Vandy Howell, Ph.D., at p. 52:1-13.

[308] See, e.g.,

- "Naturally, the value of the statistical analysis depends on the substantive knowledge that informs it." Kaye, David H., David A. Freeman, 2011, Reference Guide on Statistics, Reference Manual on Scientific Evidence, Third Edition, National Academies Press: Washington, D.C., 211-302, at p. 215.
- "Observational studies can produce legitimate disagreement among experts, and there is no mechanical procedure for resolving such differences of opinion.", Kaye, David H., David A. Freeman, 2011, Reference Guide on Statistics, Reference Manual on Scientific Evidence, Third Edition, National Academies Press: Washington, D.C., 211-302, at p. 222.
- "Even in cases where quantitative analysis is important, a solid qualitative analysis and a good factual knowledge of the industry will provide both a necessary basis for quantitative work and a source for vital reality checks regarding the conclusions emerging from empirical work." Davis, Peter, Eliana Garces, 2010, Quantitative Techniques for Competition and Antitrust Analysis, Princeton University Press: Princeton, at p. iv.

The empirical and documentary evidence supports Hitachi overcharges.

I. Dr. Williams' use of my overcharge model is not appropriate

Dr. Williams uses my overcharge model "for the sole purpose of identifying 'differences' in Panasonic Corporation's CPT pricing behavior and the pricing behavior of other manufacturers".[309] Dr. Williams applies my overcharge regression to the subset of the observations in my data that have prices for Panasonic, BMCC, or MTPD and to a subset of observations in my data that purportedly include prices for Panasonic or MTPD, but not BMCC.[310] On the basis of his analysis, Dr. Williams concludes that Panasonic's and MTPD's CPT pricing is lower than other manufacturers' pricing.

It is not clear why Dr. Williams is using my overcharge model for this task. Data on Panasonic and MTPD's prices are available, as are data on many other CPT manufacturers' prices. Thus, a direct comparison could be made. Indeed, that is what Dr. Williams does elsewhere when he examines the correlation between different firms' prices; see Section VI.

Dr. Williams' interpretation of the results of his analysis is simply wrong. The results Dr. Williams obtains from applying the overcharge model to only Panasonic CPT data indicates how much higher Panasonic's CPT prices were during the cartel period relative to the non-cartel period.[311] The overcharge estimate based on all defendant CPT data indicate how much higher all defendants' prices were during the cartel period relative to the non-cartel period. Comparing the two overcharge estimates does not indicate how Panasonic's prices compare to all defendants' prices. That is, Dr. Williams' analysis does not provide a basis for his claim regarding Panasonic's prices relative to other firms' prices.[312]

Even if Dr. Williams' result were factually correct, that Panasonic charged lower prices than other Defendants, his interpretation of this result is incorrect. He is correct that such pricing could be consistent with Panasonic's non-participation in the cartel. But the result is just as consistent with Panasonic's participation in the cartel; Panasonic could have charged more in the actual world than it would have absent the cartel and have been the lowest priced manufacturer in both the but-for and actual worlds.

VIII. Defendants' experts' margin evidence is consistent with my overcharge estimates

Dr. Wu, Ms. Guerin-Calvert, and Prof. Willig each conclude that the overcharges I have estimated are too high because, according to their calculations, certain Defendants would have

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[309] Dr. Williams specifically says that he is not evaluating the validity of my overcharge model. Williams Opposition Report, at ¶¶90-95 and Exhibits 15A, 15B, and C-10.

[310] See "Exhibit 15 C-10.do" in Dr. Williams' back-up papers.

[311] Dr. Williams says that he is not using my overcharge model to calculate overcharges.

- Williams Opposition Report, at ¶90.
- Deposition of Darrell Williams, 15 September 2014, at 218:25-219:12.

Nonetheless, Dr. Williams reports and focuses on the coefficient that gives the overcharge. For example, his Exhibit 15 graphs the "Estimated Overcharge".

[312] Williams Opposition Report, at ¶95.

earned low or negative accounting margins if they had not imposed the overcharges I have estimated.[313] As I explain below, these analyses cannot support the conclusions they have drawn regarding profitability, exit by suppliers, or investment in the but-for world. Even if the calculations were reliable, they wouldn't mean anything, because Defendants' experts' conclusions about the possibility of negative profit, exit, and investment are consistent with my prior testimony regarding the but-for world.

As I laid out in my merits report,[314] in the absence of the cartel's anticompetitive conduct, the likely outcome would have been "ruinous competition", caused by the combination of declining demand and excess capacity. The Defendants themselves recognized that the CRT industry was in secular decline and that, absent the cartel, they would have engaged in ruinous competition.[315] In such an environment, price need not cover fixed costs in order for firms to continue in operation. Firms will continue to supply output as long as price exceeds variable cost, even for long periods of time, because earning some variable profit is better than earning nothing.[316]

My view of the but-for world is therefore consistent with the continued supply of CRTs by some firms despite prices that are too low to cover fixed costs. The but-for world is also consistent with exit from the industry of some firms that supplied CRTs in the actual world.[317] The firms that would have continued to supply CRTs in the but-for world would have tended to be those with the lowest variable costs.[318] Market-wide quantity demanded would have been greater in the but-for world than in the actual world due to lower prices, absent the cartel's price-fixing.[319] Therefore suppliers would have had greater economies of scale than in the actual world, and therefore lower costs than in the actual world, for two reasons: (*i*) because demand would have been stimulated by lower prices in the but-for world and (*ii*) because if some firms exited, then the market-wide output would have been divided among fewer firms than supplied CRTs in the

[313] Wu Opposition Report, at ¶¶19, 66; Guerin-Calvert Opposition Report, at ¶133; and Willig Opposition Report, at ¶¶94-95.

[314] Netz Class Cert Report, at 38-39.

[315] Netz Merits Report, at 21.

[316] Scherer, F.M., and David Ross, 1990, Industrial Market Structure and Economic Performance, Third Edition, Houghton Mifflin Company: Boston, p. 294. Prof. Willig agreed at his deposition that when "considering whether or not to cut back or exit, then garden variety blackboard economics says you want to look at the avoidable costs is the word we use on the blackboard. If you were to exit, what costs would you avoid? You'd avoid operating cost, you'd avoid the labor cost, the material costs and you might avoid some of your capital costs to the extent that those facilities where fungible had other uses were not entirely sunk in this particular application. But if the costs really are totally specialized can't do anything with these facilities but make CPTs you still might want to exit but you wouldn't take into account those completely sunk costs." 19 September 2014, Deposition of Robert Willig, Ph.D., at 310:11 - 311:6. Regarding "the extent … those facilities where fungible had other uses", Prof. Willig conceded that "[a]ll I really know is that it's not extremely fungible, but I don't know how significant the remaining salvaged costs might be." Deposition of Robert Willig, 19 September 2014, at 311:7 - 14.

[317] I use the word "exit" to mean the discontinuation of supply of CRTs; firms may exit the supply of CRTs yet continue to supply other products.

[318] Prof. Willig agreed at his deposition that firms with high variable costs would tend to be the first to exit an industry when prices are declining, other things equal. Deposition of Robert Willig, 19 September 2014, at 301:5 - 15.

[319] Dr. Wu and Prof. Willig agree. Wu Opposition Report, at ¶21, footnote 29 and Deposition of Robert Willig, 19 September 2014, at 303:12 - 17.

actual world, so each firm that continued to supply CRTs would have produced more CRTs than in the actual world, with greater economies of scale and lower costs than in the actual world.

A. Defendants' experts' conclusions regarding exit and investment are consistent with my view of the but-for world

As I show below, opposing experts perform the same superficial calculation and represent the result to be margins in the but-for world; their calculation cannot support their conclusions regarding exit in the but-for world.[320] Even if opposing experts' gross margin calculations were taken at face value as what they allege them to be ("what gross margins and operating margins would have been in the 'but for' world"[321]), and even if the accounting margins they calculate were economically meaningful, they would mean nothing more than that some suppliers may have exited the industry earlier in the but-for world than they did in the actual world and others may have continued to operate despite prices below the level that would allow them to cover fixed costs and non-cash costs such as accounting depreciation.[322]

The logic that links Defendants' experts' manipulation of accounting margins to their conclusions regarding the reasonableness of my estimates of overcharges (and hence but-for prices) is not entirely clear to me. They seem to suggest that in their view, the mere fact that some firms' accounting margins would have been negative (or even that firms did not earn a normal rate of return on embedded investments) is evidence that my estimates of overcharges are unreasonable.[323] Firms that have invested in capacity, which later becomes excess in supply because it is capable of producing only products which (subsequent to investment) will foreseeably become obsolete, are likely to be unable to cover fixed costs and accounting depreciation.[324] To suggest that my estimate of but-for prices is unreasonable because some firms would not have been profitable at those prices (by any measure of profitability) simply makes no sense, because my testimony about the but-for world is consistent with some firms earning negative profits. The Defendants foresaw ruinous competition and formed a cartel to make the best of a bad situation; even with price-fixing they often earned negative operating margins in the actual world, as shown by Ms. Guerin-Calvert;[325] that some may have been unprofitable absent the cartel is not surprising.

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[320] See Section VIII.B.5 below.

[321] Guerin-Calvert Opposition Report, at ¶133 (emphasis supplied). Willig Opposition Report, at ¶94, footnote 98. I show below that the claim that these are the margins that "would have been" in the but-for world rests on strong, implausible, mostly unstated assumptions.

[322] Dr. Wu includes depreciation and overhead costs in his calculation. Wu Opposition Report, at ¶19 and footnote 27. Neither Ms. Guerin-Calvert nor Prof. Willig disclose the composition of the costs they use in their calculation of but-for gross margins. In its total company reporting, Chunghwa's "cost of sales" (the cost measure it uses to calculate "gross margin") included 98% of the company's depreciation in 2007. See Chunghwa Picture Tubes, Ltd., 25 April 2008, Chunghwa Annual Report 2007, http://www.cptt.com.tw/cptt/chinese/backend/files/AR_2007rar.pdf, accessed 20 February 2009, at p. 124. I am unaware of reporting of just how much depreciation is in the cost of sales in Chunghwa's CRT segment or the costs used to calculate gross margins for other firms whose margins were analyzed by opposing experts.

[323] Wu Opposition Report, at ¶65 and Guerin-Calvert Opposition Report, at ¶133.

[324] See footnote 316 and the text to which it is appended.

[325] Of the 37 observations of operating margins in Ms. Guerin-Calvert's exhibit for the years 1998-2008, 15 of them are negative. Guerin-Calvert Opposition Report, at Exhibit 10, p. 87.

The claim that prices too low to cover depreciation and fixed cost are unreasonable is contrary to evidence that such prices existed in the actual world, as shown in Ms. Guerin-Calvert's own exhibit.[326] CRT manufacturers wrote off assets in recognition of the fact that they had little value, and based their supply and pricing decisions, and analyses of competitive conditions, on *cash costs*, exclusive of fixed cost, overhead, and depreciation.[327] In the but-for world, they would have made the same economically sound decisions to sell at prices too low to cover depreciation and fixed cost, but prices and profits would have been lower, and the inevitable CRT industry shakeout may have happened earlier than it did in the actual world.

Two of the opposing experts suggest another link between their use of accounting margins and their opinion that my estimate of but-for prices is unreasonable: exit, they say, would have reduced the supply of CRTs, thereby raising price.[328] This is contrary to basic economics: market prices are determined by market supply, not the supply of any particular firm. With productive capacity in excess supply,[329] the exit of one firm creates an opportunity for firms that continue to supply CRTs to expand their scale, thereby reducing their costs, and to supply the output that had formerly been supplied by the exiting firm.[330]

Finally, Prof. Willig offers the following logic that connects the margins he calculates with his assessment of my estimate of but-for prices: there would have been less investment. He does not say why he considers this to be "further evidence of the unreliability" of my overcharge estimates;[331] I assume he means to imply that less investment in the but-for world would have

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[326] See footnote 325.

[327] See, e.g.,

- "Competition ... As you know, Thomson has announced write-off of assets for their Mexicali factory a few weeks ago. As a result, their cost structure is similar to GP (no depreciation expense). … Their factory is sounding very similar to GP [LPD's Gomez Palacio (Mexico) CPT plant].... no depreciation ..." Canavan, Pat, 15 November 2004, E-mail: Re: 29RF global pricine [sic] status, PHLP-CRT-023911 - PHLP-CRT-023915, at 3914.
- From an LPD "competitive analysis": "Considering CRT industry situation and structure … industry focusing on cash cost … this analysis is focused on industrial cost curves based on labor costs per product … Key variables by competitor / site [sub-bullet] Factor Costs (salary and wages) by region, location [sub-bullet] Net Productivity (labor $/product) by site… Labor productivity is key criteria to determine CPT cost competitiveness." Vaartjes, Wiebo, 26 September 2005, Email: competitive analysis, LPD-NL00140679 - LPD-NL00140692, at 0684.

[328] Dr. Wu is explicit: he opines that PDC's likely exit in the but-for world "would likely have increased the market prices of CRTs above what they otherwise would have been without the alleged conspiracy". Wu Opposition Report, ¶43. Prof. Willig says merely that it would have been rational for unprofitable firms to "scale back investment, capacity and production, but this supply reduction is not incorporated into Dr. Netz's analysis, which is further evidence of the unreliability of her overcharge analysis." Willig Opposition Report, ¶95. At his deposition, Prof. Willig was explicit: in his opinion, "there would have been alterations to the supply side. In particular Chunghwa would not have been doing what it did… that would have meant that prices would not have fallen as far as she [Dr. Netz] suggests." Deposition of Robert Willig, 19 September 2014, at 296:10 - 21.

[329] See Netz Class Cert Report, at 19-21.

[330] When asked at his deposition whether, when some firms exit an industry, if other firms have excess capacity, "you would not necessarily have a situation where there would be reduced supply that tended to push prices up," Prof. Willig acknowledged that "in most market settings it [excess capacity] … does affect prices." Deposition of Robert Willig, 19 September 2014, at 299:24 - 300:13.

[331] See footnote 313 above.

resulted in higher prices. The evidence relied upon by Defendants' experts for their opinions regarding investment in the but-for world is not a suitable basis for their conclusions because none of that evidence is an analysis of the profitability of investment opportunities in the but-for world, as I explain below.[332]

As a general matter, I acknowledge that lower output prices generally reduce the profitability of investment in additional capacity. However, any investments which were made in the actual world at monopoly CRT prices but would not have been made in the but-for world at competitive CRT prices represent socially inefficient over-investment due to the cartel's supra-competitive CRT prices. Due to excess capacity, supra-competitive investments may have had no effect on CRT prices.[333] Prof. Willig's expert report offers no evidence suitable for analyzing the profitability of investments; no evidence, in particular, of the extent to which investment that occurred in the actual world would not have occurred in the but-for world and only insinuation regarding the effect the alleged reduction in investment would have had on price.

To summarize, the Defendants' experts' analysis is generally consistent with my prior testimony regarding profitability, exit, and investment in the but-for world. I see no basis in logic or economics for the conclusions the Defendants' experts have drawn, on the basis of that analysis, about my estimate of but-for prices.

B. Defendants' experts' calculated margins are based on actual profitability of past investments

1. Defendants' experts calculate margins based on accounting data

Dr. Wu, Ms. Guerin-Calvert, and Prof. Willig perform the same calculation: they begin with actual accounting margins, they deduct my overcharge estimate from revenue, and re-calculate margins using that lower, but-for, level of revenue, assuming that nothing else relevant to accounting margins (such as costs) would be different in the but-for world than in the actual world.[334] Because it is used in common by three of the opposing experts, I call it, for convenience, "the common margin calculation".

2. Defendants' experts rely on strong, unstated assumptions

Strong assumptions are necessary in order to assert that the result of the common margin calculation is "what gross margins and operating margins would have been in the 'but for' world".[335] Dr. Wu acknowledges that the following two assumptions underlie the common margin calculation; Ms. Guerin-Calvert and Prof. Willig do not: (*i*) that the demand curve for

[332] See below at Section VIII.B.5.a). In brief, the margins estimated by Defendants' experts are average, retrospective accounting margins earned on embedded capital, not the prospective incremental economic profit expected to be earned by incremental investment.

[333] See footnote 330.

[334] Willig Opposition Report explains this calculation in ¶94, footnote 98. For the method used by Ms. Guerin-Calvert and Dr. Wu, see their work papers: a050_profit_margins.xlsx, and Exhibit 03, 04, 05, 06, and 07.xlsx, respectively.

[335] See foonote 321.

CRTs is vertical, so that the quantity of CRTs demanded is not influenced by price, and (*ii*) that unit costs would have been the same in the but-for world as in the actual world.[336]

The common margin calculation also assumes that there would have been no difference in the timing of supplier exit in the but-for world from the timing in the actual world, and no effect on margins of an earlier-than-actual shakeout in the industry.[337] This implicit assumption is inconsistent with their testimony regarding the "implausibility" of firms continuing to operate with negative margins in the but-for world. As I explained above, exit by some suppliers is consistent with my prior testimony regarding the but-for world, and exit would likely have resulted in lower costs – and hence higher margins – than in the actual world for the firms that continued to supply CRTs.

3. A negative gross margin does not necessarily mean firms will exit the CRT market

Defendants' experts perform the common margin calculation using as input two actual-world margins: (*i*) gross margin and (*ii*) operating margin. The two margins differ in the costs deducted from revenue in the calculation of profit. Gross margin deducts "cost of sales", which includes, for the company about which we know most, "material costs, labor costs, [accounting] depreciation, change in inventories, and overhead costs".[338] Operating margin deducts "cost of sales" and all other operating costs, too.

Dr. Wu testified at his deposition that "as a general matter, when I think about gross margins I think about capturing the *variable costs*... that might be material costs, that might be – there are all sorts of per-unit costs that might be in there. What I'm trying to separate out are broader fixed costs and overhead costs."[339] That description is contradicted by his expert report, which says that the cost of sales he used to calculate PDC's gross margin includes depreciation (a fixed cost) and overhead costs.[340] When the cost that is used to calculate gross margin includes fixed cost, negative gross margins are consistent both with prices above average variable cost and with prices below variable cost. Given that ambiguity, no conclusion can be drawn about whether firms will continue to supply output, even for long periods.[341] Dr. Wu's conclusion that "[n]egative profits would have likely caused PDC to shut down its CRT operations"[342] cannot follow from his evidence.

In the context of a discussion of economic decisions such as exit and investment, statements made by Ms. Guerin-Calvert such as "in the but- for world Chunghwa would not have been able

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[336] Wu Opposition Report, at ¶¶21 and 30, footnote 48.

[337] See footnote 313. Prof. Willig acknowledged at his deposition that in the but-for world, some firms may have exited, but his margin calculation was done under the assumption that no firms that produced in the actual world exited the market in the but-for world. 19 September 2014, Deposition of Robert Willig, Ph.D., at 293:24 - 294:4 and 297:2 - 14.

[338] See footnote 322 above.

[339] 12 September 2014, Videotaped Deposition of Lawrence Wu, Ph.D, at 82:14-23, emphasis added.

[340] "In PDC's data, the cost of sales includes material costs, labor costs, depreciation, change in inventories, and overhead costs." Wu Opposition Report, ¶19, footnote 27, emphasis added.

[341] See Section VIII above.

[342] Wu Opposition Report, at ¶43.

to cover even its direct cost of goods sold" are meaningless without knowing whether the "direct cost of goods sold" includes accounting depreciation and fixed cost.[343] When asked at her deposition, Ms. Guerin-Calvert testified that she did not know whether the costs used to calculate her gross margin included depreciation and overhead; she referred to information in her backup to answer questions about exactly what is in her costs; Prof. Willig also said he believes that that information on the components of cost variables is in his backup materials.[344] Their backup materials contain no more information about what is in the cost they use to calculate gross margin other than the superficial: they represent "cost of goods sold". There is no indication in either Ms. Guerin-Calvert's deposition testimony or her backup materials that she knows whether the "cost of goods sold" she uses includes, as does the "cost of sales" used by Dr. Wu, depreciation and overhead.[345]

4. Accounting margins are a poor measure of economic profitability

The result of the Defendants' experts' common margin calculation is irrelevant because, as I showed above, negative margins are consistent with my testimony about the but-for world. In addition, accounting margins are well known to be poor measures of economic profitability.[346] I show below that no conclusion about whether to supply output for extended periods can be drawn from negative margins, given the accounting data used as input to the calculation.

Perhaps the most well-known difference between accounting profit and economic profit is in the treatment of capital.[347] When capacity is in excess supply, demand is declining or decline is foreseeable, and capacity has no use other than to produce the product for which demand is declining, particular care in the treatment of capital is appropriate. In such conditions, the value of capital can vanish;[348] if it does, then both elements of the economic cost of capital, depreciation and the opportunity cost of capital, are zero.[349] In practical terms, if nobody wants

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[343] Guerin-Calvert Opposition Report, at ¶133.

[344] 17 September 2014, Deposition of Margaret Guerin-Calvert, at 235:12-15 and 236:23-237:1. 19 September 2014, Deposition of Robert Willig, Ph.D., at 312:18 - 313:4.

[345] See footnote 322.

[346] The seminal articles on this topic are,

- Fisher, Franklin M., 1987, On the Misuse of the Profits-Sales Ratio to Infer Monopoly Power, RAND Journal of Economics, Vol. 18, No. 3, 384-396.
- Fisher, Franklin M. and John J. McGowan, March 1983, On the Misuse of Accounting Rates of Return to Infer Monopoly Profits, The American Economic Review, Vol. 73(1), 82-97.

[347] "If book depreciation and economic depreciation are different (they are rarely the same), then the book profitability measures will be wrong; that is, they will not measure true profitability." Brealey, Richard A. and Stewart C. Myers, 2000, Principles of Corporate Finance Sixth Edition, Irwin McGraw-Hill., at p. 336. This textbook is cited in Guerin-Calvert Opposition Report, at ¶136.

[348] For empirical evidence that CRT productive capital had little value in alternative uses, see Netz Merits Report, at 17. See also 16 July 2012, Deposition of Panasonic Corporation, Panasonic North America and MTPD 30(b)(6) Witness Tatsuo Tobinaga, at 147:9-149:8: When Panasonic decides to shut down CRT production lines, Panasonic "basically will destroy them."

[349] Economic depreciation is the change in the market value of an asset during the period; once the market value vanishes, it no longer changes, so economic depreciation is zero. The opportunity cost of capital is the cost of holding rather than selling the capital; it is the return the firm could make during the period by selling its capital at the beginning of the period and investing it in an asset of similar risk. Holding assets with zero value incurs no

to buy your factory, it doesn't cost you anything to use it to supply output, other than the costs caused by production: incremental materials and labor.

The appropriate measure of profitability to consider exit and investment is the economic profit, which does not include accounting depreciation and overhead expenses. If one does not know whether the measure of profitability includes these expenses, one can make no conclusion about exit or investment.

5. Defendants' experts' margins cannot support opinions regarding exit and investment

a) Defendants' experts do not perform an analysis of investment decisions

The opinions expressed by Prof. Willig, Dr. Wu, and Ms. Guerin-Calvert regarding investment in the but-for world are unsupported by any economic analysis of the profitability of making investments in the but-for world. Economic analyses of investment decisions differ from the margin evidence cited by Defendants' experts as the basis for such decisions are based on the net present value (NPV) of *future* expected *incremental cash* flows from a *particular* investment; the investment is profitable if the NPV exceeds the cost of the investment.[350] In contrast, Defendants' experts' common margin calculation purports to represent a but-for *retrospective* measure of the *accounting* profitability on average over *all* of the firms' embedded investments in CRTs. For that to be a useful criterion for investment, the profitability of a new investment would have to be the same as the average profitability of previous investments, the past would have to be a good predictor of the future, and accounting profit would have to be equal to cash flows. None of these are good assumptions in the case at hand. Defendants' experts mention none of these assumptions in their analysis of investment.

To illustrate how wrong using Defendants' experts' margins as an investment criterion can be, it is easy to show that it may actually *contra*-indicate whether an investment is profitable; that is, *low* retrospective margins on embedded investments (not high margins, as opposing experts assume) may indicate that some incremental investments will be profitable. Consider, for example, one of the investments in the actual world noted by Ms. Guerin-Calvert: investment in relocation of productive capacity to lower-cost regions.[351] According to the correct criterion for investment (NPV), relocation will be profitable if the present value of *future* cost savings from moving production to a low-cost region exceeds the cost of making the investment in relocation.

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opportunity cost. Prof. Willig testified that when considering whether to exit or continue to produce output, capital costs should be considered *if* the capital has other uses, but if not, "you wouldn't take into account those completely sunk costs"; see footnote 316.

[350] "Invest in any project with a positive net present value. This is the difference between the discounted, or present, value of the future income and the amount of the initial investment." Brealey, Richard A. and Stewart C. Myers, 2000, Principles of Corporate Finance Sixth Edition, Irwin McGraw-Hill., at p. 23. Prof. Willig agrees that while the past can inform the future, investment decisions should be based on expectations of the future. 19 September 2014, Deposition of Robert Willig, Ph.D., at 306:11 - 307:2.

[351] Ms. Guerin-Calvert refers to " investments to a) build/upgrade capacity for producing larger monitor sizes; b) invest in other product improvements, such as the transition from curved CRTs to flat CRTs and higher resolution CDTs;199 and c) invest in relocating production capacity to lower cost regions." Guerin-Calvert Opposition Report, at ¶138.

High costs in the current location are associated both with low retrospective average margins on embedded investment and with high cost savings from moving to a low-cost region. Then retrospective margins on embedded investments, if used to evaluate investment in relocation to low-cost regions, have a systematic tendency to incorrectly indicate that investment should not be made in cases where the investment would be profitable when evaluated by the correct (NPV) criterion.

b) Defendants' experts do not perform an analysis of exit from the CRT market

None of the evidence presented by Defendants' experts is an analysis of a firm's decision to exit or continue to supply CRTs. Defendants' experts' assertions regarding the "sustainability" of the but-for prices I have estimated, and the likely exit of suppliers at those prices, therefore cannot be supported by the evidence they present.

An economic analysis of the decision to exit would compare the expected net present value of two *future* cash streams, the stream of cash expected if the firm continues to supply CRTs in the future and the stream of cash expected in the future if the firm discontinues supply of CRTs. In an analysis of the decision to exit, the relevant costs are variable costs of operation and avoidable costs (costs that can be avoided by exit); fixed costs and costs which cannot be avoided by exit are immaterial to the analysis because the costs are borne in both circumstances.[352] In contrast, the analysis of margins performed by all three Defendants' experts makes no attempt to model firms' prospective, variable profit at any point in time. They make no attempt to account for foreseeable changes in the industry (such as the exit of some firms). The costs they include in their calculation of gross margins include non-cash costs (such as accounting depreciation) and fixed cost (such as overhead cost).[353] As I explained above, firms need not cover fixed and non-cash costs in order to rationally decide to continue to supply output. The costs Defendants' experts include in their calculation of operating margins are even more inclusive and even less relevant to firms' exit decision. No conclusion about whether firms would have exited in the but-for world can be drawn from the evidence cited by Defendants' experts.[354] The evidence used by Defendants' experts is also contrary to evidence regarding CRT suppliers' actual analyses of market conditions: they based their supply and pricing decisions, and analyses of competitive conditions, on cash costs, exclusive of fixed cost and depreciation.[355]

IX. The overcharge was passed-through to class members

[352] Prof. Willig testified at his deposition that when considering exit, firms would consider the variable cost of production and avoidable cost, and capital cost, *if* the capital had other uses, but not sunk (unavoidable) costs. See footnote 316.

[353] See footnote 322.

[354] It is conceivable that a set of assumptions (*e.g.* "the past is a perfect predictor of the future") could be drawn up which would permit an exit decision based on the evidence presented, but opposing experts do not state any such assumptions, and they would be highly implausible in an industry undergoing fundamental changes, such as the CRT industry in the relevant time period.

[355] See footnote 327.

After reviewing the opinions expressed in Defendants' Expert Reports, my conclusions regarding pass-through remain: any overcharges imposed by Defendants on direct purchasers were passed through to class members at a rate of at least 100%.

My conclusions are based on the documentary evidence I have reviewed,[356] as well as the 63 empirical studies that I have conducted. The pass-through estimate is 100% or higher for all studies. These studies estimate pass-through rates using data from all types of resellers, for all at-issue products, at all levels of the distribution channel, and over the entire class period. In my damages calculations, I use a 100% pass-through rate, which results in a conservative estimate of total damages borne by class members.

The relevant question is to quantify, *all else equal*, the degree to which the overcharge was passed-through to class members. The challenge to the economist is to use real-world data to isolate the answer to this question, given that in the real world, all else is not equal.

A. My pass-through studies covers the entire distribution chain and damages period

To estimate pass-through, I regressed the price of CRTs or CRT products on cost; this approach can be implemented for any portion of the distribution channel or over the entire channel. In either case, the coefficient on the upstream cost variable gives the pass-through rate. Price and cost data are required to calculate the pass-through rate, but there may be some product characteristics (e.g., screen size) that also impact the price level. To the extent possible, I included variables to control for different product characteristics; the composition of each dataset determines those characteristics for which I can control in each study. I ran separate regressions for monitors and TVs and, whenever possible, I controlled for the economically meaningful product attributes including screen size, CRT manufacturer, resolution, high definition, and flat screen.[357]

To date, I have conducted 63 total pass-through studies including sales for all types of at-issue CRT products, by all types of resellers operating at all levels of the distribution channel. Exhibit RR-62 lists the calculated pass-through rates and other statistical results for each of the studies I have conducted. Exhibit RR-63 provides information about the firms, the data they provided, and the specification for each of the studies I have conducted. Exhibit RR-71 lists the files relied upon for each pass-through study. Because I completed one new study,[358] I have updated the following exhibits as well: Exhibit RR-73 (95% confidence intervals for television pass-through rates);[359] Exhibit RR-75 (channel coverage for pass-through studies);[360] and Exhibit RR-76 (time

[356] Netz Merits Report, 91-95.

[357] Although there are other product characteristics, application, size, resolution, and manufacturer are the characteristics commonly used to differentiate CRTs products. Not all datasets provided sufficient detail to control for all of these attributes, while some datasets provide additional information, allowing me to control for other attributes including, but not limited to: VCR or DVD TV combinations, wide screen, HD-ready, picture-in-picture, and re-manufactured/refurbished products.

[358] I have completed one new pass-through study, for the electronics retailer PC Richard, since submitting my merits report. I use this study to respond to the deposition testimony from a PC Richard representative that Prof. Ordover cites. See Section IX.

[359] This exhibit plots the calculated pass-through rate and corresponding 95% confidence interval for each of the studies. All 63 of the confidence intervals either include 100% or are wholly above 100%. The 52 studies with confidence intervals wholly above 100% are the studies that find a pass-through rate that is statistically significantly

period coverage for retailer studies). The total number of CRTs with unique price-cost combinations represented in these datasets was over 178 million.[361] These datasets included transactions beginning as early as February 1994 and continuing into November 2011.

B. Prof. Ordover estimates pass-through rates using an alternative method

Prof. Ordover and I both use regression analysis to estimate pass-through rates, but his method is a variation on the approach I employ. His model assumes that there are economically meaningful differences across each and every product, regardless of how similar they may be. The regression approach he uses controls for differences between products. In contrast, my approach controls for the meaningful product characteristics for each product; that is, I control for those characteristics that impact price.

Prof. Ordover then calculates what he refers to as cumulative pass-through rates by averaging all of the rates he calculates for each level of distribution, then multiplying all of the levels together. These cumulative rates build upon his individual regressions and rely on the false assumption that each and every CRT travels through each level in his overly-complex depiction of the distribution chain.

To support the implausibly low pass-through rates that result from his method and the cumulative rates he erroneously calculates, Prof. Ordover relies upon incomplete and misleading testimony from CRT resellers. Prof. Ordover also discusses several factors—including focal point pricing, and rebates—that can impact the pass-through rate; however, he makes no final determination as to whether any of these factors do, in fact, have any real impact in the context of this case.

C. Defendants' expert mischaracterizes my conclusions regarding pass-through

Professor Ordover consistently mischaracterizes my testimony regarding pass-through. Specifically, I do not assume that the alleged cartel overcharges were passed through in a uniform manner to each member of the class at a rate of 100%.[362] Although my conclusions are

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greater than 100%. The remaining eleven studies with confidence intervals that include 100% are the studies that result in pass-through rates that are not statistically significantly different from 100%. None of the confidence intervals are wholly below 100%, meaning none of the studies result in a pass-through rate that is statistically significantly less than 100%.

[360] I have conducted studies for all of levels of the distribution channel. I presented five studies that measured pass-through from Defendants selling CRTs at the top of the channel to end customers purchasing CRT products at the bottom of the channel, and I presented three studies that measure pass-through for part of the distribution channel. Collectively, these studies covered the entire distribution channel and portions of the distribution channel, included both types of at-issue CRT products, and represented all the various types of buyers and resellers operating in the distribution channel.

[361] This number excludes tubes from the multi-level, top-and-bottom, and top-to-bottom studies. The total number of tubes including those datasets was over 193 million.

[362] See, e.g.,

- "This is so because Dr. Netz's assumption that the rate at which the alleged overcharges were passed through to indirect purchasers was a constant 100 percent throughout the 12 years of the alleged conspiracy, and that it did not differ across OEMs, retailers or products is not supported by available evidence and inconsistent with her own estimates." Ordover Opposition Report, at ¶8.

informed by economic theory and the documentary evidence in this matter, ultimately I empirically measure pass-through and conclude that any overcharges were passed through to class members at a common rate of at least 100%. I have conducted 63 pass-through studies; 52 of those studies yield a pass-through rate statistically greater than 100% and 11 found a pass-through rate that was not statistically significantly different from 100%. Based on these findings, I conclude that pass-through was at least 100% for all class members and conservatively use that figure for my damages calculations. I do not assume anything nor do I claim that the pass-through rate was uniform; based on the statistical evidence, I conclude that pass-through was 100% or higher.

Notably, for one of his own damages calculations, Professor Ordover uses this same approach. That is, Prof. Ordover calculates average pass-through rates for product distributors of 106.6% (monitors) and 101.4% (TVs). He then applies a 100% pass-through rate to the product distributors (Electrograph, Tech Data, and Viewsonic) in his damages calculations.[363] Similarly, several other experts retained in related cases also calculate pass-through rates above 100%, but use 100% for purposes of calculating damages.[364]

D. Economic theory establishes that a cartel overcharge is passed through to class members

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- "Dr. Netz assumes, as discussed above, that the alleged overcharges from the cartel were passed-through to each member of the Indirect Purchaser Class at a rate of 100%, and thus each class member was commonly affected by the alleged conspiracy." Ordover Opposition Report, at ¶45.
- "As discussed above, Dr. Netz's assumes that pass-through rates will be at least 100 percent at every point in the distribution chain, and will not vary across time, manufacturer, retailer or product are not supported by either the economics of pass-through, nor are they consistent with empirical research about the magnitude of estimated pass-through rates in a variety of industries." Ordover Opposition Report, at ¶30.

[363] See, e.g.,

- 05 September 2014, Videotaped Deposition of Janusz A. Ordover, Ph.D (Hereinafter "Deposition of Janusz A. Ordover, 05 September 2014"), at 371:15-24.
- See the backup materials for Ordover, Janusz A., 05 August 2014, Expert Report of Janusz A. Ordover, Ph.D for Best Buy, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Ordover Opposition Report"). A spreadsheet named "Frankel (Master) Damages Calculations.xlsx" contains these calculations.

[364] See, e.g.,

- Rao Merits Report.
- Hausman, Jerry A., 15 April 2014, Expert Report of Jerry A. Hausman, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Hausman Merits Report").
- Frankel, Alan S., 15 April 2014, Report of Alan S. Frankel, Ph.D for Best Buy, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Frankel Merits Report").
- Dr. Frankel also submitted merit reports for the following plaintiffs: BrandsMart; Circuit City; CompuCom; Costco; Electrograph; Office Depot; PC Richard; MARTA; ABC Appliance; Sears; Kmart; Target; Tech Data; and Tweeter.

Economic theory shows that an industry-wide cost increase, such as an increase in the cost of CRT tubes, leads to an increase in the downstream price whether the downstream industry is monopolistic, imperfectly competitive, or perfectly competitive. In the present matter, economic theory shows that CRT product prices increase when CRT tube prices increase. Economic theory also shows that the more competitive an industry, the closer the pass-through rate is to 100%. Because there is a high degree of competition throughout the entire distribution channel for CRT products, I expect that pass-through will be near 100%. However, these markets are, in fact, not perfectly competitive; therefore, pass-through may be higher or lower than 100%.

Prof. Ordover discusses several influences that can bias the pass-through rate. He assumes, for purposes of this discussion, that pass-through does not exceed 100% and, therefore, cites all of these influences as reasons why the pass-through rate is below 100%. In Sections IX.G below, I explain why each of these influences are not, in fact, determinative of the pass-through rate. Prof. Ordover has not made a determination on whether or not these influences actually do make it less likely that pass-through occurs in this case.[365] Furthermore, he argues that the market conditions are not present in this matter for pass-through to be above 100%;[366] that is, he opines that pass-through must be less than 100% based on the market conditions present throughout the CRT distribution channel. As one piece of evidence to support this claim, he cites deposition

[365] See, e.g.,

- "A. Right. I talk about price points not necessarily in the -- totally in the context of comparing it to the ideal benchmark of perfect competition, but also in the context of its relevance to pass-through analysis, but price points are based on what I know from my daily activities as a teacher of industrial organization economics are a fairly familiar concept across a broad range of retail establishments different products, not only electronics. Q. Do price points have a tendency to increase or reduce pass-through? A. That's an interesting question. I think the answer is that it depends on the time frame during which you are analyzing the pass-through. The short -- whether you are looking -- and also at the set of establishments that you are looking at in order to gauge the pass-through. So there is no simple answer. There is an interesting and complicated answer, and in my reports I cite to a recent paper by Alexandrov that tries to understand the implication of these price points for pricing decisions, but the literature is very, very old in terms of the relevance of these things for competitive market interactions." 04 September 2014, Videotaped Deposition of Janusz A. Ordover, Ph.D (Hereinafter "Deposition of Janusz A. Ordover, 04 September 2014"), at 92:5-93:8.
- Prof. Ordover testifies that excluding rebates/discounts does not necessarily bias estimation the pass-through rate: "Q. So you don't offer any opinion in your report at all as to whether this quote potential bias causes -- has a tendency to cause the regressions to overstate or understate pass-through, do you? A. I offer no bottom line opinion on that. I am pointing out that there's an issue, but I do not either attempt to solve it or to gauge its qualitative effect." Deposition of Janusz A. Ordover, 04 September 2014, at 149:19-150:11.

[366] See, e.g.,

- "In fact, rates above 100 percent one can also come up with models that generate those kind of numbers, but I don't believe that those conditions are satisfied in the current context." Deposition of Janusz A. Ordover, 04 September 2014, at 286-287.
- Prof. Ordover argues that he has never seen pass-through rates above 100%: "In my experience I have not experienced pass-through rates in excess of 100 percent, but essentially the question is whether the demand curve is bowed into the origin or bowed out. So whether they are pulling this -- pulling up northeast or whether they are pulling down southwest, those are properties of the demand curve that's a matter for pass-through." Deposition of Janusz A. Ordover, 04 September 2014, at 289:1-290:8.
- "The markets for CRT products are not perfectly competitive suggesting that the correct pass through rates may be less than 100%." Ordover Opposition Report, at 18.

testimony from Dr. Frankel, Plaintiffs' expert for multiple direct action plaintiffs; [367] however Dr. Frankel's testimony reports some pass-through rates that exceed 100% so he must believe these conditions exist to the extent those rates are plausible.[368]

Prof. Ordover's claim that I do "not attempt to reconcile [my] empirical findings with [my] theoretical arguments"[369] is unfounded. First, I cite several papers that estimate pass-through rates greater than 100%.[370] Second, in my original report, I explain how economic theory supports pass-through of the cartel overcharge, including both textbook models of perfect competition as well as real world scenarios.[371] The discussion includes theoretical examples supported by documentary evidence produced in this matter.[372] My findings are also consistent with other expert economists working on related cases:

- Dr. Mohan Rao, economic expert for Dell plaintiffs, testified that economic theory establishes that pass-through rates can be "more or less than 100 percent"; ultimately, he calculates multiple pass-through rates, all of which exceed 100%. He also uses a conservative pass-through rate of 100% for his damages calculations.[373]
- Dr. Allen Frankel, economic expert for multiple direct action plaintiffs, testifies that a 100% pass through rate is a reasonable expectation based on economic theory. Ultimately, he calculates multiple pass-through rates using three different regression approaches and concludes that the mean pass-through estimate is 104.3% and the median estimate is 114.6%. He also uses 100% when calculating damages.[374]

[367] Dr. Frankel submitted reports for the following companies: Best Buy; BrandsMart; Circuit City; CompuCom; Costco; Electrograph; Office Depot; PC Richard; MARTA; ABC Appliance; Sears; Kmart; Target; Tech Data; and Tweeter. These reports, although not identical, are the same for any purpose cited in this report. Ordover, Janusz A., 05 August 2014, Expert Report of Janusz A. Ordover, Ph.D for Best Buy, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Ordover Best Buy Report"), at 21-22.

[368] See Frankel Merits Report, at ¶31 and Exhibit 14.

[369] Ordover Opposition Report, at 22.

[370] Netz Merits Report, at footnote 260.

[371] See Netz Merits Report, at Sections VIII.B.1 - VIII.B.4.

[372] For example, see Section VIII.B.2.a) titled "The more competitive the industry, the closer the pass-through rate is to 100%" which is followed by Section VIII.B.2.b) titled "The distribution channel is highly competitive and therefore the pass-through rate is likely close to 100%". Netz Merits Report, at 91-93.

[373] See, e.g.,

- "The 'pass-through' rate is the percentage by which cost increases are passed through into finished or intermediate good prices. Under constant marginal costs and competitive market conditions, economic theory tells us that the pass through rate will be 100 percent. However, under other conditions, the pass-through rate could be more or less than 100 percent." Rao Merits Report, at ¶82.
- "Thus, the pass-through results indicate a pass-through of CDT overcharges of at least 100% into the prices paid by Dell for its purchases of CRT monitors. I conservatively employ a pass-through rate of 100% in calculating damages to Dell." Rao Merits Report, at ¶82.

[374] See, e.g.,

- Prof. Jerry Hausman calculates a 120% pass-through rate for the product maker Sharp; he also uses 100% when calculation damages.[375]

Contrary to Prof. Ordover's claims, my pass-through rates are consistent with economic theory and the market conditions in this matter.

E. The distribution channel is conceptually straightfoward

Professor Ordover argues that the distribution channels for CRT products are long and complex and that direct purchasers are a heterogeneous group.[376] Prof. Ordover's depiction is overly complex and founded upon the following false assumptions:

- Resellers with different business models, but providing similar services, constitute a unique channel of distribution.
- The number of steps in the distribution channel is relevant for determining if cost changes are passed-through to class members.
- Resellers at different levels of distribution face considerably different competitive conditions.

I address these assumptions below.

1. Product manufacturers with different business models compete against each other

Prof. Ordover complicates the manner in which CRTs flow from Defendants to class members. In Figure 1, he diagrams all of the possible steps through which a CRT could travel from Defendants to end users; however, many of the divisions he creates are not meaningful. For example, he unnecessarily creates categories of CRT product makers—companies that all perform the same function—based on the fact they may have different business models. However, the relevant issue for mapping the distribution channel is what function these firms perform, not the terms and conditions under which resellers conduct business with other intermediary resellers. For example, in Figure 1, Prof. Ordover distinguishes between PC original equipment manufacturers (PC OEMs), original design manufacturers (ODMs), and contract manufacturers, despite the fact they all makes CRT products. Similarly, he creates divisions between vertically integrated product manufacturers and all other types of product manufacturers. That is, he argues that LGE (operating as a CRT product maker) is somehow fundamentally different from a company such as Dell (also a product maker) based on the fact

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- "Perfect competition is a theoretical ideal, but if higher costs persist across a market – and the CRT cartel is alleged to have persisted over a period of nearly 13 years – a reasonable economic benchmark or expectation in a highly competitive market is 100 percent" Frankel Merit Report, at 8-9.
- Frankel Merits Report, at Exhibit 13.

[375] Prof. Hausman calculates 120% pass-through for sales from Sharp's foreign affiliates to Sharp in the U.S. concluding that "The estimated pass-through coefficient is 1.197, which indicates that a one dollar increase in CPT price is associated with a $1.197 increase in the television price paid by Sharp in the U.S. The estimated pass-through coefficient is statistically significant (p = 0.004). Because the hypothesis of a 100% pass-through rate cannot be rejected (p = 0.612), to be conservative I use a 100% pass-through rate in my calculations." Hausman Merits Report, at 34.

[376] Ordover Opposition Report, at 7-9.

that LGE is affiliated with a parent company that is a tube manufacturer, whereas Dell is not. These false distinctions make the distribution channel appear more complex than it actually is.

2. The channel-length pass-through rate is determined by market forces

Regardless of whether or not the distinctions above are appropriate, the number of steps in the distribution channel is not necessarily relevant to the pass-through rate. Because consumers at the end of the distribution chain have a choice where to buy CRT products and resellers are competing for their business, I expect the channel-length pass-through rate to be relatively consistent regardless of the number of intermediary resellers. If it were true that one distribution chain had a lower overall pass-through rate than another distribution chain, then the high pass-through chain would eventually be abandoned as a bad business model. As such, one would expect their pass-through rates to be relatively similar.[377]

3. The steps in the distribution channel are very competitive

Whereas there is some variation in the competitive conditions faced by different resellers, Prof. Ordover overstates these differences; he also does not provide any documentary evidence to corroborate his conclusions. The relevant factors are that:

- All stages of distribution are highly competitive.[378]
- The firms in the distribution channel are selling manufacturing services or distribution services.
- Firms may have different pricing strategies and business models; regardless, they are in the same market and face the same competitive conditions.
- Furthermore, there is considerable evidence of competition among various types of resellers, thus they must face similar competitive conditions.[379]

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[377] Of course this does not imply that prices would be identical at all these locations. On the contrary, stores sell other services as well as the product, and the provision of these other services results in some price variation. For example, one must typically pay an annual membership fee for the warehouse stores and they usually do not offer much, if any, customer assistance. On the contrary, the smaller scale stores are usually geared towards consumers who are willing to pay more for the stores' customer service expertise.

[378] See Exhibits 53 and 54 to the Netz Merits Report.

[379] See, e.g.,

- "EMSNow: It is the relationship between EMS and ODM that I wanted to explore with you. It seems that many companies, including your former company BenQ, employ an ODM model sometimes and an OEM model other times. How can they do that without competing with their contract-manufacturing clients? Jeffrey Wu: The answer is they cannot. Once an ODM launches products under its own brand name, the competition with its OEM client begins." 10 November 2005, An Interview with iSuppli's Jeffery Wu - ODM vs EMS, what happens next?, EMSNow, http://www.emsnow.com/npps/story.cfm?ID=15416, accessed 18 June 2008, at p. 1.
- "Proview OEMs displays for other vendors as well and also sells them under its own brand." Spiwak, Marc, 23 April 2004, Xerox, KDS Focus On Flat-Panel Displays, http://www.crn.com/it-channel/18842421;jsessionid=0N2X3CDEVLA3HQE1GHPSKHWATMY32JVN, accessed 24 August 2009, at p. 1.
- "[Forbes.com] How much of your [Jabil's] business is original design manufacturing? [Main] It's a rapidly growing part of our business that is directly competitive with the so-called Taiwanese ODM players. We

Resellers are competing with each other for sales of CRTs and CRT products throughout the entire distribution chain.

As discussed in Section IX.E.2, resellers at all levels of the distribution channel compete for sales to downstream customers and, therefore, behave in a similar manner.

F. Testimonial evidence does not refute my conclusions regarding pass-through

Prof. Ordover and Prof. Rubinfeld cite testimonial evidence from market participants as well as the declaration submitted by Thomas Trail on behalf of Dell suggesting that pass-through does not occur.[380] This evidence, however, fails to address the relevant question for pass-through, which is how do resellers react to cost increases that are significant, permanent, and affect all firms without changing their relative competitive positions? In other words, the appropriate question asks how resellers respond when faced with cost changes that are comparable to the alleged overcharge. This testimony does not address that question; rather, it merely shows there may be some instances in which a cost change does not result in a price change.

This testimony, however, fails to address the relevant question. This fact is best illustrated by deposition testimony from Prof. Rubinfeld who reiterates that the specific cost changes referred to in the Trail declaration are not necessarily related to the alleged cartel overcharges. Furthermore, when asked if he knew whether the cost changes to which Mr. Trail is referring were significant, permanent, and industry-wide, Prof. Rubinfeld replied, "No, I definitely don't know that."[381] Prof. Ordover concurs that pass-through is more likely to occur when these conditions—those that are comparable to the cartel overcharges—are present, further undercutting the reliability of this evidence.[382]

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don't break it down as a separate business. Our thought process is that the EMS and ODM markets are essentially converging. ODM and EMS are really different tactical ways of accomplishing the same thing, and that's the outsourcing of electronic hardware." Clark, Hannah, 28 December 2005, Q & A: Jabil Circuit's CEO Tim Main, http://www.forbes.com/2005/12/27/jabil-ceo-tim-main-cx_hc_1228jabil.html, accessed 18 August 2009, at p. 2.

- "'We are answering the needs of our customers by offering original design for manufacturing (known as ODM) capability within the EMS business model,' said Lumetta." Jabil Circuit Inc., 30 May 2001, Jabil Expands Technology Services, http://www.jabil.com/news/news_releases/2001/05302001.html, accessed 18 August 2009, at p. 1.
- "However, in some cases EMS providers and ODMs are competing for the same business and EMS companies are offering OEMs ODM-type programs. Many EMS companies have beefed up their design expertise often through acquisitions. Design expertise is the competitive advantage for ODMs and many OEMs use ODMs for that technical know how." Carbone, Jim, 16 January 2003, ODMs offer design expertise, quicker time to market, http://www.purchasing.com/index.ASP?layout=articlePrint&articleID=CA269147&article_prefix=CA&article_id=269147, accessed 01 February 2008, at 2.

[380] Trail, Thomas, 14 July 2014, Declaration of Thomas Trail, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division)(Hereinafter "Trail Declaration").

[381] Deposition of Daniel Rubinfeld, 08 September 2014, at 104:7-105:1.

[382] "Q. Sure. Would you agree that where a cost increase for a product component is industry-wide, significant, and permanent and holding everything else constant, that finished product prices containing that component will increase? A. Given all these assumptions, I think it's more likely." Deposition of Janusz A. Ordover, 05 September 2014, at 527-528.

The testimonial evidence cited by Prof. Ordover and Prof. Rubinfeld merely shows that pass-through decisions can be complex and identifies the conditions under which some cost changes may not be passed-through, but nothing more.[383]

Prof. Ordover also cites testimony from several resellers suggesting that not every cost change is passed-through in a uniform manner. For example, he cites Thomas Pohmer, a P.C. Richard employee who testified that when faced with cost increases or decreases the decision to change prices would depend "on what the competition is doing" among other factors.[384] This quote is entirely uninformative because it fails to identify whether the cost changes are significant, permanent, and industry-wide. Regardless, to assess the validity of Mr. Pohmer's claims, I have completed a new pass-through study using data from P.C. Richard and the results of that empirical analysis show that P.C. Richard passes through cost changes at a rate of 120%; see Exhibit RR-62. I have also completed an alternative study for P.C. Richard using Prof. Ordover's regression approach; the results of that study show that P.C. Richard passes through cost change at an even higher rate of 132%.[385] Mr. Pohmer's testimony contradicts Prof. Ordover's own statistical analysis in a related CRT case, about which he opined that PC Richard passed through "nearly all of their increases in wholesale prices to retail customers."[386]

Similarly, Prof. Ordover relies on testimony from Nikhil Nayar of Target who stated "while the cost does bear some relevance to the retail that we set, predominately it's going to be what's happening in the competitive environment."[387] The notion that costs only "bear some relevance" to retail prices is contrary to fundamental economics as well as common sense; regardless, this testimony is again undercut by the available empirical analyses. Specifically, Prof. Ordover's own pass-through results estimate two pass-through rates for Target's sales of monitors: the first study uses retail prices and yields a 104% pass-through rate; the second uses transaction prices and yields a 135% pass-through rate.[388]

Prof. Ordover also cites testimony from Christopher Re of Tweeter, an electronics retailer, who testified that, "Tweeter ultimately sold the television for what somebody was willing to pay for it. So if somebody raised our cost, we couldn't necessarily raise the cost and sell it for more if the customer didn't want to pay for more."[389] Again, this quote provides nothing informative of how Tweeter, or any other company, responds to cost changes similar to the cartel overcharges.

It is also notable that all three of the companies cited by Prof. Ordover are plaintiffs in related lawsuits. Each of these firms argues that upstream firms are able to pass-through cost changes to

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[383] Prof. Ordover confirms this fact in deposition testimony; see Deposition of Janusz A. Ordover, 04 September 2014, at 397-99.

[384] Ordover Opposition Report, at 20 citing to 12 November 2003, Deposition of Thomas P. Pohmer, at 290-292.

[385] See my backup production for "pcr_data_cleaning.do", "pcr_report.do", and "pcr_report.log".

[386] Prof. Ordover did not conduct a pass-through study in this matter for PC Richard; he did, however, conduct one for the DAP matter in response to Dr. Frankel. The cited testimony refers to his DAP study. Deposition of Janusz A. Ordover, 04 September 2014, at 402:5-8.

[387] Ordover Opposition Report, at 20 citing to the 01 May 2014, Videotaped Deposition of Target 30(b)(6) Witness Nikhil Nayar, Volume I, at 172-173.

[388] Ordover Opposition Report, at Appendix 5.

[389] Ordover Opposition Report, at 19 citing to the 24 April 2014, Videotaped Deposition of Tweeter Opco, LLC 30(b)(6) Witness Christopher Re, at 150.

them; in fact, each has retained experts who have calculated pass-through rates to each company that are greater than 100%. These economic experts do not opine on downstream pass-through rates. Prof. Ordover does calculate downstream rates for both firms showing that pass-through is near 100% for PC Richard and over 100% for Target.[390] The witnesses cited by Prof. Ordover—who are addressing downstream pass-through for each company—are not economic experts and, as explained above, are answering incomplete, misleading, and otherwise uninformative questions. During other reseller depositions when the witnesses were asked to answer the relevant questions, the answers are markedly different:

- John O'Donnell, CompuCom director of supply chain management during the class period, testified: "Q. So the selling price would be the cost plus margin for freight and handling, plus the specific margin above that number would result in the final price to the customer? A. Yes. Q. In any instances where CompuCom sold CRT products on a cost-plus margin basis, would the customer's price move when CompuCom's price to acquire the product also moved? A. It potentially could, yes. Q. [...] Are there circumstances when a cost-plus margin sales price to a customer would not change despite CompuCom's cost changing? A. Not normally because it would -- if were receiving the product into inventory, then we're using first-in, first-out weighted average cost, so it would bring that down. If it was a drop ship, it would be reflected in the price immediately. Q. So CompuCom's cost in a cost-plus calculation would not be the cost of that particular product, but the average of products of that type held in inventory? A. Right. It's a weighted average cost because we have, you know, more expensive product up front and we're bringing in lesser price product. And so the weighted average of all that as it goes through -- as we sell it out, yes, it adjusts as we're receiving more inventory, and another reason why you don't want to hold inventory. It's not good. Q. And that weighted average cost is calculated per specific product? A. Yes, by SKU."[391]
- Paul Garcia, Brandsmart general manager, testified: "Q. So let's say that you had a margin in mind of 10 percent for a particular product, and you find out that the costs associated with that product went up a little bit, as you say they sometimes did. Would you then want to charge a higher price so that you could keep that 10 percent margin that you were going after? A. Yes, I would."[392]
- Jason Bonfig, Best Buy business team manager for desktop computers during the class period, testified: "Q. If the costs of Best Buy's CRT monitors went up, did Best Buy seek to increase the retail price of those products in its retail stores? A. Generally, the cost going up would have increased the retail [price]."[393]
- Claudine Adamo, Costco buyer for computers and peripherals during the class period, testified: "Q. Okay. In -- in a situation where Costco experienced a significant cost

[390] See, e.g.,

- Target: Ordover Opposition Report, at Appendix 5.
- PC Richards: Deposition of Janusz A. Ordover, 04 September 2014, at 402:5-8.

[391] 20 May 2014, Oral and Videotaped Deposition of John O'Donnell, at 190:10 - 191:17.

[392] 08 August 2014, Videotaped Deposition of Paul Anthony Garcia, at 83:8 - 14.

[393] 21 August 2014, Videotaped Deposition of Jason Bonfig, at 63:17 - 23.

increase from a vendor, for example, a 6 percent cost increase on a product that Costco was earning a 5 percent margin on, and in a situation where all competitors were experiencing the same kind of cost increase, where there was no reason to believe that the cost change was temporary, would Costco necessarily increase its retail price on that product? [...] A. If -- if I kept it at the same price. So on an active item. If the -- if it would have taken me below cost, yes, I would have increased the price."[394]

- Costco testified: "Q. I have a follow-up question to ask you about that. In a situation where […] Costco's cost changes were significant -- for example, a six percent cost increase on a product that Costco was earning a five percent margin on -- and in a situation where all competitors were experiencing the same type of cost changes, and in a situation where Costco had no reason to believe that that cost change was temporary, would Costco necessarily increase its retail price on that product? [...] A. Well, if it's an item that we're going to continue to purchase at the higher cost, at some point we're going to have to make an adjustment […] Q. And when you say make that adjustment, given the set of factors I indicated in my question, the adjustment would be upwards, correct? The adjustment to the retail price would be upwards? A. Yes. Because, in that example, if we kept the -- the previous retail price, we would be at a negative margin, which is really against -- it's against our company policy to -- to sell things below cost. Yeah."[395]

Clearly the testimonial evidence from resellers varies on this issue; however, when asked the appropriate questions, the responses are more consistent and reliable.

G. Pass-through is consistently 100% or more despite the presence of complicating factors in the data

Prof. Ordover presents several factors that he claims reduce the likelihood that pass-through occurs, including focal point pricing,[396] menu costs,[397] and whether or not rebates or other discounts are included in the data.[398] Below I reiterate why these issues are red-herrings; in fact, Prof. Ordover has not actually made any determination as to whether or not these factors actually do impact pass-through, which is confirmed by his deposition testimony.[399]

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[394] 29 July 2014, Videotaped Deposition of Claudine Adamo, at 148:20 - 149:13.

[395] 07 December 2012, Deposition of Costco Wholesale Corporation 30(b)(6) Witness Geoffrey Shavey, at 122:15 - 124:5.

[396] Ordover Opposition Report, at 31.

[397] Ordover Opposition Report, at 42.

[398] Ordover Opposition Report, at 22.

[399] See, e.g.,

- "Q. So you don't offer any opinion in your report at all as to whether this quote potential bias causes -- has a tendency to cause the regressions to overstate or understate pass-through, do you? A. I offer no bottom line opinion on that. I am pointing out that there's an issue, but I do not either attempt to solve it or to gauge its qualitative effect." Deposition of Janusz A. Ordover, 04 September 2014, at 149:19-150:2.
- "Q. Do price points have a tendency to increase or reduce pass-through? A. That's an interesting question. I think the answer is that it depends on the time frame during which you are analyzing the pass-through. The short -- whether you are looking -- and also at the set of establishments that you are looking at in order to

1. Focal point pricing, menu costs, rebates, and other discount pricing are consistent with pass-through

I addressed these topics in my opening report, explaining that there is nothing inconsistent with the existence of pass-through and focal point pricing, loss leaders, discount pricing, and several other pricing practices.[400] Even if the existence of focal point pricing, for example, does reduce the likelihood that pass-through occurs, the results of my empirical studies account for that influence. In other words, the data used for my studies would reflect the fact that some firms may price at focal points, and the results still show that pass-through occurs.

Regarding rebates and other discounts, Prof. Ordover is correct that I am unable to always determine whether or not a specific dataset contains rebates or other incentives,[401] but as he conceded there is no reason to believe the results are biased.[402] I have tested his concerns in two ways.

- First, I have already presented pass-through studies for Sam's Club, Wal-Mart, and Target that use "retail" or "list" prices in one study, then use "transaction" prices in a second study. Presumably, the difference between these two prices includes at least some rebates, discounts, and other promotions, and the results of these studies—each using different price measures—are consistent, leading me to conclude that rebates, discounts and incentives are generally not a concern. See Exhibit RR-62.
- Second, in some datasets there are additional variables that allow me to more directly test how including rebates, discounts, and other incentives impacts the pass-through rate. I have tested the pass-through studies from Dell, Philips, and OfficeMax
  - Dell: I calculated a pass-through rate of 118% using the actual transaction price variable; using the list price variable, which excludes rebates and discounts, I calculate a pass-through rate of 108%. In this instance, including rebates increased the pass-through rate.[403]
  - OfficeMax: I calculate pass-through for monitors and desktops, in each instance using a price variable inclusive of rebates (i.e., transaction prices) and another that removes rebates (i.e., list prices). Using transaction prices, I calculate rates of 101% (monitors) and 109% (desktops); using list prices I calculate rates of 106% (monitors) and 110%

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gauge the pass-through. So there is no simple answer. There is an interesting and complicated answer, and in my reports I cite to a recent paper by Alexandrov that tries to understand the implication of these price points for pricing decisions, but the literature is very, very old in terms of the relevance of these things for competitive market interactions." Deposition of Janusz A. Ordover, 04 September 2014, at 91:25-93:8.

[400] Netz Merits Report, at Section VIII.B.

[401] Ordover Opposition Report, at 22-23.

[402] "Q. So you don't offer any opinion in your report at all as to whether this quote potential bias causes -- has a tendency to cause the regressions to overstate or understate pass-through, do you? A. I offer no bottom line opinion on that. I am pointing out that there's an issue, but I do not either attempt to solve it or to gauge its qualitative effect." Deposition of Janusz A. Ordover, 04 September 2014, at 149:19-150:2.

[403] Dell's data contain two price variables. The variable total_rev_retail_usd is the "list" price; total_rev_disc_usd is the price the customer paid. In my original Dell study, I use the total_rev_disc_usd to calculate the price. My new study uses the total_rev_retail_usd variable. See "dell_rebuttal.do" and "dell_rebuttal.log" in my backup production.

(desktops). In this instance, including rebates decreased the pass-through rate, but not below 100%.[404]

- Philips: I calculate pass-through for monitors and TVs, in each instance using a price variable inclusive of rebates (i.e., transaction prices) and another that removes rebates (i.e., list prices). Using transaction prices, I calculate rates of 110% (monitors) and 106% (TVs); using list prices I calculate rates of 114% (monitors) and 107% (TVs). In this instance, including rebates decreased the pass-through rate, but not below 100%.[405]

Prof. Ordover presents an analysis to support the claim that focal point pricing precludes pass-through. He examines how cost changes less than $5 are passed-through compared to those greater than $5. His analysis suffers several flaws. First, aside from saying at least some of the alleged overcharges in this matter might be less than $5, he provides no concrete evidence to support the claim that this analysis represents cost changes that are, in fact, informative of how resellers would respond to the alleged overcharges. Second, the analysis is predicated on the belief that some resellers might not pass-through some very small cost changes in the short run,[406] but the class period in this matter is over 12 years long, suggesting this analysis says little about how firms will respond to those cost changes more analogous to the cartel overcharges (i.e., larger) over a much longer period. Third, the non-sensical results illustrate how uninformative this analysis is: his rates range from negative 283% to positive 634%; for a single reseller, Target, he measures pass-through of negative 283% for cost changes less than $5, but 133% for cost changes above $5. These results are not credible: a negative 283% pass-through rate indicates that when the cost increases by $1, the price decreases by $2.83; a positive 634% pass-through rate indicates that when the cost increases by $1, the price increases by $6.34. The implication of these results is that the consumer would prefer to see the firm's costs go up, because it results in a lower price to the consumer, which is simply inconsistent with basic economic principles. The results of this analysis strongly suggest he is exploiting the noise in these transactional data, a fact he warns against in his own deposition.[407]

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[404] OfficeMax's data contain a price variable, rt_salspet, which includes reductions such as coupons, deals, and price overrides. I use this price variable in my original OfficeMax studies. The variable rt_priredr contains the total of all reductions for each transaction. I sum rt_salspet and rt_priredr to obtain the price excluding reductions, which I use in my new study for CRT monitors and desktops sold by OfficeMax. See "officemax_rebuttal.do" and "officemax_rebuttal.log" in my backup production.

[405] Philips's data contain four price variables. "List Price" is an unmodified dealer list price. "Net value" subtracts direct discounts, such as product and channel discounts, from the "List Price" variable. "Net/net price" is zero for most observations in Philips's data, but it subtracts postponed rebates, such as international and other rebates, from "Net value". "Pocket price" subtracts central office rebates and cash discounts from "Net/net price". My original Philips studies use the "Net value" variable to calculate the price. I conduct a new study using the "List price" variable. See "philips_rebuttal.do" and "Philips_rebuttal.log" in my backup production.

[406] "Thus, it may be that, due in part to the practice of focal point pricing, retailers in the short run might not pass-through small overcharges, e.g., of the orders of magnitude estimated by Dr. Netz." Ordover Opposition Report, at ¶54.

[407] "As I said, the fact that somebody finds an estimate of 101 percent, 101 percent is not at all problematic from my perspective because the data is noisy and, therefore, just to Hitachi Ltd it on the 100 percent every time you do the estimates is not likely to be – it's not likely to begin with, right. But if you are looking at these estimates, and you are coming up with numbers which are out of line with both economics and common sense, then you have to ask

I have attempted to use all of the data available and, even though these data may not always be ideal, they are still informative and reliable as shown by these additional analyses. After completing these additional analyses testing the impact of rebates and discounts in these data and considering the other influences Prof. Ordover discusses that could impact pass-through, my conclusions regarding pass-through do not change.

2. Vertical integration is consistent with pass-through

Prof. Ordover claims that I fail to recognize the economic literature regarding vertically integrated firms and pass-through; specifically, that these firms have the incentive to pass-through at rates less than 100%.[408] Prof. Ordover fails to actually cite any literature to support his assertion; rather, he relies on his assumption that anything, such as vertical integration, that departs from the textbook model of perfect competition will result in pass-through rates less than 100%. When asked to support these claims during deposition he provides a vague, ambiguous answer that, at best, suggests vertically integrated firms could have the incentive to pass-through less than 100%, but provides no evidence why that may be true in this matter.[409] He also

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yourself why is it happening. What is going on. What is driving the results." Deposition of Janusz A. Ordover, 05 September 2014, at 444:7-444:18.

[408] See, e.g.,

- "Dr. Netz fails to recognize that economic literature indicates that vertically integrated firms, such as many of the Defendants in this matter who manufacture both CRTs and finished televisions or computer monitors, have the incentive to pass-through less than 100 percent of their cost changes in the form of higher prices." Ordover Opposition Report, at ¶30.
- "These estimates conform more closely to the predictions of economic theory, with the pass-through rates for product manufacturers, which include CRT finished product manufacturers some of which are vertically integrated into television and computer monitor manufacturing, estimated to be less than 100 percent, while retailer pass through rates are around 100 percent. As discussed above, this empirical finding of finished product manufacturer pass through rates below 100 percent is consistent with both the presence of vertical integration and the high level of product differentiation in finished product manufacturing." Ordover Opposition Report, at ¶44.
- "Q. Okay. Besides the nature of the margins that OEMs and other manufacturers have upstream, are there any other specific characteristics of the Cathode Ray Tube upstream market that in your view make it more likely that pass-through at that level will be less than 100 percent? A. Well, actually, I point out to the issue of vertical integration. I raise that as an important consideration, which I believe links the empirical work or the observed pass-through rates to sound industrial organization economics, noticing that at that level of the distribution chain, the pass-through rates may be, in fact, less than 100 percent, and the reason being that vertical integration, as we discussed at length yesterday, does affect the incentives and the abilities of firms to take these cost shocks and translate them into prices for final products in a way that may be different for a firm that procures the input in the merchant market from the firm that transfers the product internally within the firm's structure." Deposition of Janusz A. Ordover, 05 September 2014, at 356:10-357:8.

[409] "Q. Why do vertically integrated firms have an incentive to pass-through less 100 percent of cost changes? A. Well, because -- anyway, it's a complicated question, but the answer intuitively, as I said, I am not going to derive it for you here as we sit, is that a vertically integrated firm has two choices for any particular unit of output that it makes. It can either sell it into what people refer to as the merchant market, which is where third parties that need the input to purchase it, or it can use it for itself. When it sells it into the merchant market, it gets the margin equal to the merchant market price minus its costs. When it sells it to itself, it makes the margin equal to the margin on the end product minus the marginal costs of the end product, which includes the component. And depending on the balance of these margins and depending on the elasticities of demand for the input by the merchant customer which is derived from demand for the final product, the firm will have to make a profit optimizing decision how to price in order to maximize the two flows of its profits, and because of the diversion between its product and the product

concedes that, again, he has not actually made any final determination as to whether or not vertical integration actually does have an impact on the pass-through rate.[410] In fact, he suggests the results of my studies support his claim. That is, he testifies that "if you are looking at Dr. Netz's pass-through estimates, you will see that there is an identifiable reduction at the level of pass-through to -- manufacturer pass-through, and one of the reasons, and I am not 100 percent sure that's the only reason, but is most likely that the manufacturers who are -- many of whom are vertically integrated are pricing differently than those who are not vertically integrated."[411] Prof. Ordover's claims are patently false: the pass-through rates I calculate for vertically integrated product makers do not show an "identifiable reduction" in pass-through rates from those calculated for all other types of resellers.[412] See Exhibit RR-62.

Aside from being vague and unsupported, there are additional problems with Prof. Ordover's argument, including:

- The pass-through rates Prof. Ordover calculates for product manufacturers do not support his assumptions. Specifically, he calculates pass-through rates for six monitor product manufacturers and, contrary to his suggestion, the highest pass-through rates are for Philips (70%) and Toshiba America Information Systems (83%), both of which are affiliated with tube manufacturers. Furthermore, the lowest two rates for Envision (30%) and Tatung (26%) are not only so low as to not be credible, but they are also for firms that are not vertically integrated.[413]
- The wide variation in Prof. Ordover's results cast doubt on their reliability. For example, he calculates a 26% pass-through rate for Tatung and an 83% rate for Toshiba America Information Systems. He provides no explanation for why there is such large variation in his results for firms that generally face similar competitive conditions. During deposition he is questioned about some of the implausible rates he calculates in his direct action report, conceding that they are, in fact, "controversial, problematic", but when averaged

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going sold by the merchant – firm's buying the input in the merchant market and then competing downstream with the firm's own product, the seller will take those cross elasticities and diversion ratios which is what they represent into account in deciding how to price. It doesn't make much sense to somebody who hasn't worried about these things, but that's essentially the economics of it. When I am not very vertically integrated, the only thing I care about is my profit on the unit of output that I sell into the merchant market. If I am vertically integrated, I care not only about the margin on the unit I sell to the output -- to the merchant market, but I also care about the diversion of sales from one side to the other, and that is the reason why this incentive may -- is different." Deposition of Janusz A. Ordover, 04 September 2014, at 97:18-99:14.

[410] "Q. Did you study the extent to which the prices charged by CRT product manufacturers to its own affiliates for CRT products diverged from those charged to third parties? A. No, that was not part of the assignment." Deposition of Janusz A. Ordover, 04 September 2014, at 100:15-21.

[411] Deposition of Janusz A. Ordover, 04 September 2014, at 101:2-9.

[412] I calculate the following pass-through rates for product makers: Philips (100% monitors, 106% TVs); Sanyo (150% TVs); Sharp Electronics (104% TVs); Tatung (100% monitors); Toshiba America Consumer Products (117% TVs); Toshiba America Information Services (112% monitors); ViewSonic (118% monitors).

[413] Ordover Opposition Report, at Appendix 5.

are "quite encouraging."[414] The individual rates he calculates here are similarly problematical, undercutting the validity of his approach.

- Many of Prof. Ordover's pass-through rates are implausibly low to the extent they defy economic logic and common sense. When asked about these low rates, Prof. Ordover justifies them as "relatively more possible" than if he observed them in the more competitive downstream retail environment.[415] This argument is problematical in that Prof. Ordover has not done any work to assess the degree of competition at either the tube distributor or product manufacturer levels;[416] rather, he simply assumes they are less competitive and, therefore, can justify such implausibly low pass-through rates. Whereas these levels are likely somewhat less competitive than the retail level, they are still very competitive as I show in my original report.[417] Dr. Frankel comes to this same conclusion in his expert report[418] and Prof. Rubinfeld acknowledges the same during deposition.[419] In fact, Prof. Ordover recognizes there is "good deal of competition" at the product manufacturer level as well.[420]

Prof. Ordover repeatedly states that vertical integration will reduce the likelihood that pass-through will occur, but he fails to cite the literature upon which his claims rest; regardless, his empirical results undercut those claims anyway.

H. Defendants' experts' pass-through analysis is unsound

[414] "Q. And for the Benq Corporation monitors you report a pass-through rate of 144 percent? A. Right. Q. Now, do you not elsewhere in your report opine that pass-through rates above 100 percent are not plausible? A. Yes, they are controversial, problematic, and if you look under Vision, it says 155 percent. However, when you average it out, it tries to -- the results are actually quite encouraging because the average pass-through rate using the normalized approach is only 84 percent which is actually quite -- not -- well, it is not surprising, and it's consistent with a lot of thinking we can do about the pass-through rates, and it's way below the average of 130 percent which are the results of Frankel's cross-section just focusing on monitors alone. So I believe that to be an improvement." Deposition of Janusz A. Ordover, 04 September 2014, at 140:14-141:8.

[415] 'Q. Does it make sense that a product manufacturer would be able to consistently pass-through only 53 percent or 58 percent of a cost increase in your view in the long-term? A. Again, I think that probably would depend on the reality of the marketplace in which that manufacturer --manufacturer functions. So it's – it's not impossible, and I think it's relatively more possible than a circumstance in which the retailer functions in a highly competitive downstream environment with very thin margins that create very little ability to absorb higher costs without translating them into -- into retail prices. So the answer would be, yes. For how long, I don't know." Deposition of Janusz A. Ordover, 05 September 2014, at 484:9-25.

[416] "Q. Did you determine whether the market for assembling televisions and computer monitors using tubes is competitive? A. I have done no independent research on that. So the only thing I have information is based on my broad understanding of the electronic sector. Q. Did you determine whether the market for selling televisions and computer monitors to intermediaries who then resell to retailers is competitive? A. Again, I have seen nothing suggesting that it's not." Deposition of Janusz A. Ordover, 05 September 2014, at 546:13-25.

[417] See Exhibits 53 and 54 to the Netz Merits Report.

[418] Frankel Merits Report, at 9-10.

[419] "Do you think it's very competitive at the product maker level, such as Dell's level, in this industry? A. I think the finished product industry is very competitive, yes. Or was competitive -- well, still is. But was definitely very competitive during this period." Deposition of Daniel L. Rubinfeld, 08 September 2014, at105: 20-24.

[420] Deposition of Janusz A. Ordover, 04 September 2014, at 300:24-301:5.

Both Prof. Ordover and I use regression analysis to estimate pass-through, but we use different variations. Below I discuss the differences between our approaches and explain why Prof. Ordover's approach is neither the only approach, nor the appropriate one, to measure pass-through in this matter.

1. Defendants' expert and I control for product differentiation differently

Prof. Ordover claims that my regression method does not properly control for differences across products or account for changes in industry conditions over time.[421] The fundamental difference between his approach and mine is that I control for those product differences that are economically meaningful. For example, whenever possible I control for size, brand, resolution, flat screen, HDTV, VCR combo, and DVD combo. These are the salient features of CRT products and the economically meaningful characteristics; these attributes were selected based on industry documents, which commonly classified products using these criteria.[422] The results of my studies are consistent; that is, they are 100% or greater, which is consistent with both economic theory and the competitive conditions present in this industry. The regression approach I use is supported by the literature.[423]

In contrast, Prof. Ordover controls for any and all differences between products, regardless of whether or not those criteria are likely to have an impact on price. His model assumes that there is unobserved product-level heterogeneity that affects the estimated pass-through rate;[424] he includes fixed effects (i.e., dummy or indicator variables) for individual products in his regressions to control for any and all differences between products; however, not all of these differences are meaningful. Below I present two examples of why his approach is inappropriate.

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[421] Ordover Opposition Report, at 26-31.

[422] Although there are other product characteristics, application, size, resolution, and manufacturer are the characteristics commonly used to differentiate CRTs.

- A DisplaySearch spreadsheet lists CRT televisions and their characteristics, including size, manufacturer, resolution/high definition, aspect ratio, and CRT technology (including whether it is a flat screen CRT). Chunghwa Picture Tubes, LTD, 20 September 2005, TV Price Summary, CHU00303245.
- In the cartel meeting notes, Defendants routinely refer to application, size, finish, and manufacturer when discussing CRTs. Netz Merits Report, Exhibit 1.

[423] The following academic articles that estimate pass-through in the same manner that I do and yield results that are corroborative of my findings See, e.g.,

- Gron, Anne and Deborah Swenson, May 2000, Cost Pass-Through in the U.S. Automobile Market, The Review of Economics and Statistics, Vol. 82(2), 316-324.
- Kadiyali, Vrinda, 1997, Exchange Rate Pass-through for Strategic Pricing and Advertising: An Empirical Analysis of the U.S. Photographic Film Industry, Journal of International Economics, Vol. 43, 437-461.
- Karp, Larry S. and Jeffrey M. Perloff, March 1989, Estimating Market Structure and Tax Incidence: The Japanese Television Market, The Journal of Industrial Economics, Vol. 37(3), 225-239.
- Sumner, Daniel A., October 1981, Measurement of Monopoly Behavior: An Application to the Cigarette Industry, The Journal of Political Economy, Vol. 89(5), 1010-1019.

[424] If there is unobserved product-level heterogeneity that is correlated with the cost variable and it is not properly controlled for, the estimated pass-through rate will be biased and inconsistent.

- The data provided by BenQ, a CRT product manufacturer, present many examples of Prof. Ordover controlling for different model numbers that are actually identical products.[425]
- Funai's data contain two CRT TVs with built-in VCRs, with model numbers 6313CE and 6313CEY; these products have identical specifications. However, because they have different model numbers, Prof. Ordover treats them separately in his pass-through regression.[426]

Above I present just two examples, but this problem is pervasive in his studies. He assumes that the model numbers (or whatever other code is used to distinguish products) provided in these data are economically meaningful; however, often these numbers are created for other purposes, such as inventory.

If it is necessary and appropriate to control for product-specific differences when calculating pass-through, one would expect to see reasonable results from the product-specific regressions that Prof. Ordover calculates; however, that is not the case. As noted earlier, many of Prof. Ordover's results show wide variation in pass-through rates for similar firms; see Section IX.G.2. Prof. Ordover provides no explanation for why one product manufacturer, Tatung, is only able to pass-through 26% of any cost change, while another, Toshiba America Information Systems, can pass-through 83%.

Furthermore, he provides no explanation for why Amazon, an extremely successful online retailer, is only able to pass-through 70% of any cost change for TVs, while PC Mall is able to pass-though 134%. Online retailing is extraordinarily competitive with very thin margins and it's implausible that one of the most successful firms is passing-through only 70% of cost changes; in other words, Amazon is absorbing 30% of any cost increase. Prof. Ordover's deposition testimony supports this notion that these results are unlikely.[427]

Prof. Ordover also argues is it appropriate and necessary to control for what he refers to as secular industry changes that affected the CRT industry over time,[428] including primarily competition from similar products such as LCD and plasma monitors and TVs.[429] Notably, he has not performed any analysis to determine whether these competing technologies did, in fact, affect how CRT cost changes were passed-through;[430] regardless, he controls for these possible

[425] BenQ produced data with two model number fields, ITEM_NUMBER and MODEL_NAME. There are numerous values of ITEM_NUMBER for each MODEL_NAME. For example, the MODEL_NAME "7254E" is associated with 14 individual MODEL_NUMBERs Prof. Ordover controls for the ITEM_NUMBER field, even though all of these products are the 7254E model with the same specifications.

[426] See: Sylvania, Undated, Sylvania Color TV/VCR 6313CE Owner's Manual, http://www.funaiservice.com/manuals/SYLVANIA/6313CE/6313CE.pdf, accessed 24 September 2014; Sylvania, Undated, Sylvania 13-Inch Color TV/VCR 6313CEY Owner's Manual, http://www.funaiservice.com/manuals/SYLVANIA/6313CEY/6313CEY.pdf, accessed 24 September 2014.

[427] "So at retail it's my overall view that the margins are slim or slimmer, and their room for absorption is much less. The fact that competition is intense also makes it less likely there will be absorption." Deposition of Janusz A. Ordover, 05 September 2014, at 354:1-4.

[428] Ordover Opposition Report, at ¶¶41-42.

[429] Deposition of Janusz A. Ordover, 05 September 2014, at 319:8-320:2.

[430] Deposition of Janusz A. Ordover, 05 September 2014, at 320:3-322:25.

influences by including a time trend in his regressions. This trend, however, is not necessary and, by his own admission, the variables in my regressions—including cost—already account for secular trends to some degree.[431] Furthermore, because the time trend is collinear with the cost trend, the resulting estimate on the cost variable will be less precise.[432]

Prof. Ordover has presented one method to estimate pass-through, but it clearly is not the only approach nor is it the appropriate approach. To inform and corroborate the results from this method he relies on testimonial evidence that is clearly incomplete and misleading as I explain above. His method calculates rates that are inconsistent and defy common sense. For example, for Sears he calculates pass-through 100% for monitors, but only 37% for TVs; in contrast, I calculate rates of 100% and 128% respectively. Although the approach I use is a variation of the approach used by other experts in this matter, my results are consistent with all of those experts. Specifically, Dr. Rao, Dr. Frankel, and Prof. Hausman all employ regression analysis to estimate pass-through and all of these experts come to the same conclusion that I do: estimate of pass-through rate in this matter is 100% or more.

2. I allow for different pass-through rates for different firms and different products

Prof. Ordover argues that I do not account for different pass-through rates for different resellers at the same level of distribution and that the pass-through rate can vary from year-to-year.[433] His claims rest on the false argument (see Section IX.C above) that I assume the alleged cartel overcharges were passed through in a uniform manner to each member of the class at a rate of 100%. First, my results clearly reflect that I allow the pass-through rate to differ across retailers and all other types of resellers; see Exhibit RR-62. Second, these studies each cover time periods of time within the class-period. Collectively they cover the entire class period; see Exhibit RR-76 to this report and Exhibits 77-78 of the Netz Merits Report, which show the time period coverage for all pass-through studies. Contrary to Prof. Ordover's claims, my conclusions are not based on the false assumption that pass-through is 100% for all products, sold by all resellers, over the entire class-period. Rather, based on the 63 empirical studies I have completed, I conclude that pass-through is at least 100% and use 100% as a conservative input into my damages calculates.

3. Defendants' experts' cumulative pass-through rates are flawed and implausible

Prof. Ordover's calculation of what he refers to as cumulative pass-through rates is fundamentally flawed. He bases this analysis on the fact that the cumulative rate is mathematically the product of the pass-through rate at each level of distribution. Above I explain why the individual rates he calculates for each level are inappropriate, but his calculation of the cumulative rate is further flawed because it assumes incorrectly that all tubes flow through each and every level of distribution. While I conduct top-to-bottom pass-through studies which are based on similar intuition (i.e., that the rates for each level can be multiplied to obtain the channel-length pass-through rate), my studies are different in a crucial dimension: I am able to

[431] Deposition of Janusz A. Ordover, 05 September 2014, at 478:12-479:16.

[432] Kennedy, Peter, 26 February 2008, A Guide to Econometrics, 6th Edition, Wiley-Blackwell: Malden, pp. 193-194.

[433] Ordover Opposition Report, at 34-36 and Figures 10 and 11.

trace specific products from one level to another. In other words, my approach accurately represents the manner in which CRT products flow through the distribution channel, whereas Prof. Ordover's does not.

Prof. Ordover's analysis grossly misrepresents the manner in which products flow through the distribution channel and relies on his overly-complex depiction of the distribution channel; see Figure 1 of the Ordover Opposition Report. Notably his Figure 1 allows for various levels of distribution to be skipped (e.g., a vertically-integrated CRT television manufacturer selling to a retailer); however, his calculations for "cumulative pass-through" include virtually all levels in the distribution chain.[434,435] Whereas this long, convoluted path may be accurate for a small share of products flowing through the distribution channel, it is a highly unlikely and inefficient route. Prof. Ordover, however, assumes all products take this route, despite providing no evidence to support this assumption. Below I present a few examples using actual data that illustrate why his assumptions are false and render his cumulative pass-through rates are meaningless.

a) Tube distributors are not always used

Prof. Ordover's analysis assumes that all CRT tubes sold by Defendants flow through tube distributors. If true, the only direct purchasers of tubes in Defendants' sales data should be tube distributors. This is a simple assumption to test, which Prof. Ordover clearly has not done. First, a cursory glance the sales data provided by Defendants shows several thousand customers, all of which are clearly not tube distributors.[436] In fact, Prof. Ordover concedes he does not know the number of tubes that flow through the tube distributor level, claiming "that some tubes as opposed to a specific number of tubes went through that level."[437] His analysis, in contrast, assumes that all tubes as opposed to some specific number of tubes flow through that level, which is clearly incorrect.

b) Product makers typically sell directly to retailers

There are similar problems at the product maker level. Specifically, it is common for product makers to sell directly to retailers, skipping the product distributor level altogether. Though product makers may not sell all CRT products to retailers, at least some of their sales do not flow through product distributors. Again, Prof. Ordover assumes, without any justification, that all products sold by product makers flow through product distributors.

[434] Ordover Opposition Report, at Figure 7.

[435] Prof. Ordover calculates cumulative pass-through by multiplying the average pass-through rates for tube distributors, product makers, product distributors, and brick and mortar retailers. Prof. Ordover leaves the internet retailer level out of this calculation.

[436] See Exhibit 64 of Netz Merits Report for Defendant data sources.

[437] "Q. So if you don't know what fraction of tubes were sold by tube distributors, you have no idea if the tube distributor link in your distribution chain is even relevant, right, sir? A. It's relevant to the extent that some tubes as opposed to a specific number of tubes went through that level. Some tubes went through these distributors, and they ended up a step down. Then if I could -- if the interests were in trying to figure out how much these tube distributors were overcharged, then we would have to estimate the extent of overcharge to tube distributors. It was not my assignment. I don't know whether it was somebody else's assignment. It certainly was not mine." Deposition of Janusz A. Ordover, 04 September 2014, at 68:20-69:14.

For example, Sharp Electronics (a product maker) purchases tubes from defendants[438] then sells CRT televisions to retailers such as Best Buy, Costco, Fry's, and Wal-Mart.[439] In this example, Sharp skips the tube distributor and product distributor levels. Though Sharp also sells to product distributors and purchases tubes from tube distributors such as Toshiba America Electronic Components (TAEC), not all of Sharp's products flow through every step of Ordover's distribution chain. This is inconsistent with his calculation of the cumulative pass-through rate.

c) Tracing products correctly gives plausible estimates

The top-to-bottom pass-through studies that I conduct rely upon the same intuition as Prof. Ordover's rates, but I do not assume that products flow through all levels of distribution. That is, I do not impose any distribution path, but rather rely upon the data to show the appropriate path. For example, I conducted a top-to-bottom pass-through study using Toshiba tubes and CRT televisions sold by Costco. In this study, I am able to trace the following: tubes sold by Toshiba America Electronic Components (TAEC) to Toshiba America Consumer Products (TACP); TACP CRT televisions being sold to Costco; and Costco selling Toshiba CRT televisions to end-users. In this instance, the data informs me that TACP bypasses the product distributor level for some products; in contrast, Prof. Ordover's method assumes all products flow through a product distributor. That is, using Prof. Ordover's cumulative pass-through rate method to conduct this same study would erroneously include the product distributor step and, hence, result in an incorrect pass-through rate. This example clearly illustrates how the conditions that his method imposes are contrary to reality and exposes why his cumulative pass-through calculation is unreliable.

Although the intuition underlying Prof. Ordover's calculation of cumulative pass-through rates is accurate, the implementation of this calculation is flawed. Neither the individual pass-through rates that Prof. Ordover estimates for each level of distribution, nor the assumptions underlying his calculation of cumulative pass-through rates across all level are credible. As such, his application of these cumulative pass-through rates in his damages calculations is unsubstantiated.

I. My conclusion is unchanged: the overcharge is passed through to end users

[438] Sharp purchases tubes from entities such as Chunghwa Picture Tubes (Malaysia), Hitachi Electronic Devices (USA), LG Philips Displays USA, MT Picture Display, Orion, Philips, various Samsung entities including Samsung Display Devices and Samsung SDI, Technology Displays Americas, Thomson, and Toshiba. See Sharp's purchase data files:

- Sharp Electronics Corporation, 1994, Sharp Purchase Data, SHARP-CRT-00000129.
- Sharp Electronics Corporation, 1998, Sharp Purchase Data, SHARP-CRT-00000130.
- Sharp Electronics Corporation, 1998, Sharp Purchase Data, SHARP-CRT-00000140.
- Sharp Electronics Corporation, 2001, Sharp Purchase Data, SHARP-CRT-00000141.

[439] See:

- Sharp, 2010, Sharp Electronics CRT Sales Data October 1997 to March 2001, <<Oct 97 - Mar 01 Legal CRT Antitrust.xls>>.
- Sharp Electronics Corporation, 2011, Sharp Electronics CRT Product Sales Data FY2001 - FY2007, <<CRT Sales by Month for FY 2001 - 2010.xls.XLS>>.

My conclusions regarding pass-through remain unchanged after reviewing the arguments put forth by Defendants' experts. Specifically, the overcharges imposed by Defendants on direct purchasers were passed through to class members at a rate of at least 100%. Above I explain why Defendants' experts' arguments are misleading, inaccurate, or otherwise uninformative to the relevant question at hand. My conclusions are consistent with economic theory, market conditions, the documentary evidence, and the data.

X. Total damages are $2.8 billion

Defendants' experts Dr. Wu and Prof. Ordover present their own calculation of total damages based on various alterations to presumed volume of at-issue commerce.[440] More specifically, Dr. Wu posits three different cartel date ranges based on when PDC [Panasonic] is presumed to be part of the cartel, while Prof. Ordover basis his calculations according to his assessment of FTAIA and indirect purchaser issues.

I examined the data and facts and found the complaint allegations well supported by economic analysis applied to the case record. Accordingly, I calculated damages for the allegations in the complaint. I disagree with Defendants' experts' more narrow view of cartel impact. However, although I disagree with Defendants' experts' conclusions, should the court find that the cartel was limited in the time period affected or the CRT products affected, the total damages calculation can be adjusted accordingly.

XI. Defendants' conduct harmed class members

In short, the conclusion that Defendants engaged in a variety of collusive activities resulting in overcharges to the class is supported by a variety of evidence types: documentary evidence; economic analyses of the body of evidence; cartel participants' deposition testimony; and econometric analyses of Defendants' sales data.

Given the characteristics of the industry, the cartel had the market power to increase price – entry barriers protected the cartel from competitive entry, and competitive pressure from LCDs was not sufficient to prevent an overcharge.

The Defendants engaged in a pattern of conduct designed to reduce capacity and production and increase price. The conduct included a hierarchy of regular meetings between different levels of Defendants' management teams; frequent communications among Defendants by phone, e-mail, and bilateral meetings; agreement on prices, production, and capacity; and monitoring of prices, production, and capacity. Econometric analysis confirms that the most easily quantifiable part of the pattern of conduct – target prices – caused Defendants' actual price to increase.

I applied a widely accepted, standard economic method to Defendants' actual price data as well as third-party data that captured non-cartel supply and demand determinants of price. As expected, the overcharge analysis confirmed the economic analysis that the cartel's actions raised prices. I estimate that the overcharge to direct purchasers was 22.0% for CDTs and 9.0% for CPTs for 1995-2006. Once it became public that the Department of Justice was investigating a related industry (LCDs), the overcharges fell to 11.4% and 3.1% for 2007.

Economic theory predicts that the overcharge would be passed through to class members (end users), and that the more competitive each level in the distribution channel the closer pass-

[440] See, Wu Opposition Report, at Section VI and Ordover Opposition Report, at Section V.

through would be to 100%. I conducted 63 pass-through studies that covered all types of firms at each level of the distribution channel as well as studies that covered the entire distribution channel for both CRT products for the entire damages period. The pass-through estimates are 100% or higher for all 63 studies.

Finally, using the overcharge and pass-through estimates combined with an estimate of how much class members had spent on CDTs in monitors and CPTs in TVs, I calculate that the harm done to class members by this conspiracy was $2.8 billion.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief. This declaration was executed on the 26 day of September 2014, at Ann Arbor, Michigan.

JANET S. NETZ

Subscribed and sworn to before me this 26th day of September 2014.

BRIAN P ROSEWARNE
Notary Public - Michigan
Washtenaw County
My Commission Expires May 20, 2021
Acting in the County of _____

Notary Public

My commission expires: _____

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Dr. Janet S. Netz

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Education

Ph.D. economics, University of Michigan, 1992
M.A. economics, University of Michigan, 1990
B.A. economics, University of California at Berkeley, 1986, *cum laude*

Employment

Founder and Partner, applEcon, May 2001 to present
Visiting Associate Professor, University of Michigan, Fall 2001, Fall 2002, Fall 2003
Associate Professor, Purdue University, Fall 2001 to January 2003
Visiting Assistant Professor, University of Michigan, Winter 2001
Assistant Professor, Purdue University, Fall 1994 to Spring 2001
Assistant Professor, University of Delaware, Fall 1992 to Summer 1994

Courses Taught

Industrial Organization (undergraduate and doctoral)
Antitrust and Regulation (undergraduate)
Intermediate Microeconomics (undergraduate and master's)
Microeconomic Principles (undergraduate)
International Economics (undergraduate and master's)

Honors and Awards

Outstanding Antitrust Litigation Achievement in Economics, awarded by the American Antitrust Institute, for work In re TFT-LCD Antitrust Litigation, 2013.

Publications

"Are All Men's College Basketball Players Exploited?", with Erin Lane and Juan Nagel, *Journal of Sports Economics*, 15(3), June 2014, 237-262.

"Price Regulation: Theory and Performance", in *Regulation and Economics*, Roger J. Van den Bergh and Alessio M. Pacces, eds., Edward Elgar Publishing, 2011.

"Sports Trivia: A Review of The Economics of Intercollegiate Sports by Randy R. Grant, John Leadley, and Zenon Zygmont", *Journal of Economic Literature*, 47(2), June 2009, 485-489.

"One-Way Standards as an Anti-Competitive Strategy", with Jeffrey K. MacKie-Mason, in *Standards and Public Policy*, Shane Greenstein and Victor Stango, eds., Cambridge Press, 2007.

"International Integration and Growth: A Further Investigation on Developing Countries", with Claire Economidou and Vivian Lei, *International Advances in Economic Research*, 12(4), November 2006, 435-448.

"Maximum or Minimum Differentiation? An Empirical Investigation into the Location of Firms", with Beck A. Taylor, *Review of Economics and Statistics*, 84(1), February 2002, 162-175.

"International Integration and Growth: A Survey and Empirical Investigation", with Vivian Lei and Jon D. Haveman, *Review of Development Economics*, 5(2), June 2001, 289-311.

"Price Regulation: A (Non-Technical) Overview", in *Encyclopedia of Law and Economics*, Boudewijn Bouckaert and Gerrit De Geest, eds, Edward Elgar and University of Ghent, 2000.

"Exercising Market Power in Proprietary Aftermarkets," with Severin Borenstein and Jeffrey K. MacKie-Mason, *Journal of Economic and Management Strategy*, 9(2), Summer 2000, 157-188.

"All in the Family: Family, Income, and Labor Force Attachment", with Jon D. Haveman, *Feminist Economics*, 5(3), November 1999, 85-106.

"Why Do All Flights Leave at 8am?: Competition and Departure-Time Differentiation in Airline Markets", with Severin Borenstein, *International Journal of Industrial Organization*, 17(5), July 1999, 611-640.

"An Empirical Test of the Effect of Basis Risk on Cash Market Positions", *Journal of Futures Markets*, 16(3), May 1996, 289-312.

"The Effect of Futures Markets and Corners on Storage and Spot Price Variability", *American Journal of Agricultural Economics*, 77(1), February 1995, 182-193.

"Antitrust Policy in Aftermarkets", with Severin Borenstein and Jeffrey K. MacKie-Mason, *Antitrust Law Journal*, 63(2), Winter 1995, 455-482.

"The Economics of Customer Lock-In and Market Power in Services", with Severin Borenstein and Jeffrey K. MacKie-Mason, in *The Service Productivity and Quality Challenge*, Patrick T. Harker, ed., Kluwer Academic, 1994.

Working Papers and Work in Progress

"LCDs and Antitrust: Does Crime Pay?", with Nick Navitski and Josh Palmer, under review

"Fantasy Football Points as a Measure of Performance", with Erin Lane and Juan Nagel

"Non-Profits and Price-Fixing: The Case of the Ivy League"

"The End of Collusion? Competition after Justice and the Ivy League and MIT Settle"

"Basis and Exchange Rate Risks and their Impact on Storage and Exports"

Research Grants

"Cooperation and Competition Among Nonprofits", Nonprofit Sector Research Fund, Aspen Institute, 2000.

"Product Customization and Product-Space Positioning", Dauch Center for the Management of Manufacturing Enterprises, Summer 2000.

"Outstanding Economics Professor of the Year", Economics Club, Purdue University, 1999.

"Trade Barriers, Trade Blocs, Growth, and Convergence", Purdue Research Foundation, 1998-1999.
"Effects of Informational Asymmetry on Competition in the Residential Long Distance Calling Market", Purdue Research Foundation, 1997-1998.

"Basis and Exchange Rate Risks and their Impact on Storage and Exports", Center for International Business and Economic Research, Summer 1997.

Global Initiative Faculty Grant (Course Development), "Industrial Organization in an International Marketplace", Purdue University, Summer 1997.

"Trade, Not Aid", Purdue Research Foundation, Summer 1996.

"Trade, Not Aid", Center for International Business and Economic Research, Summer 1996.

"The Effect of Price-Fixing by Institutions of Higher Education", Purdue Research Foundation, Summer 1995.

"Applied Microeconomics/International Workshop", Purdue University, Spring 1995.

"The Market Structure of Higher Education", University of Delaware, Summer 1993.

Research Associate, Center for the Study of Futures Markets, Columbia University, 1991.

Rackham Merit Fellowship, University of Michigan, 1987-1989.

Chancellor's Scholar, University of California at Berkeley, 1983-1986.

Referee

American Economic Review
Contemporary Economic Policy
Feminist Economics
International Journal of the Economics of Business
International Journal of Industrial Organization
Journal of Economic Education
Journal of Economic and Management Strategy
Journal of Family and Economic Issues
Journal of Futures Markets
Journal of Industrial Economics
Journal of Law and Economics
Journal of Law, Economics, and Organization
Management Science
Review of Economics and Statistics
Scandinavian Journal of Economics
Telecommunications Systems

Conference and Workshop Presentations

Panel participant, "Winning or Losing: Class Certification Post-Comcast", American Bar Association, 62nd Antitrust Law Spring Meeting, Washington, DC, March 2014.

Panel participant, "Preparing Early and Often", State-of-the-Art Strategies for Managing Class Action Experts, American Bar Association, 16th Annual National Institute on Class Actions, Chicago, IL, October 2012.

Panel participant, "Hot Topics Involving Experts in Antitrust Litigation", New York State Bar Association, Antitrust Law Section, Annual Meeting, New York, NY, January 2011.

Guest lecturer, Alternative Dispute Resolution Practicum, University of Michigan Law School, April 2008.

"The Economics of Indirect Purchaser Cases", State Bar of Arizona Annual Conference, Phoenix, AZ, June 2004.

"Manipulating Interface Standards as an Anti-Competitive Strategy", Standards and Public Policy Conference, Federal Reserve Bank of Chicago, Chicago, Il, May 2004.

"One-Way Standards as an Anti-Competitive Strategy", Telecommunications Policy Research Conference, Alexandria, VA, September 2002.

"Product Proliferation and Product Space Location", Econometric Society Meetings, New Orleans, January 2001.

"The End of Collusion? Competition after Justice and the Ivy League and MIT Settle", American Economics Association Meetings, New Orleans, January 2001.

"The End of Collusion? Competition after Justice and the Ivy League and MIT Settle", Indiana University-Purdue University Indianapolis, November 2000.

"Maximum or Minimum Differentiation? An Empirical Investigation into the Location of Firms", University of British Columbia, March 2000.

"Non-Profits and Price-Fixing: The Case of the Ivy League", University of Illinois, October 1999.

"The End of Collusion? Competition after Justice and the Ivy League and MIT Settle", Baylor University, September 1999.

"The End of Collusion? Competition after Justice and the Ivy League and MIT Settle", Western Economic Association Meetings, San Diego, July 1999.

"Non-Profits and Price-Fixing: The Case of the Ivy League", University of Chicago, April 1999.

"Non-Profits and Price-Fixing: The Case of the Ivy League", Indiana University, December 1998.

"International Integration and Growth: A Survey and Empirical Investigation", Dynamics, Economic Growth, and International Trade, III, Taiwan, August 1998.

Discussant ("Fiscal Policy and International Demand Spillovers"), Dynamics, Economic Growth, and International Trade, III, An International Conference, Taiwan, August 1998.

"International Integration and Growth", Workshop on Empirical Research in International Trade and Investment, Copenhagen, June 1998.

Discussant ("Factor Endowments and the Pattern of Affiliate Production by Multinational Enterprises," by Karolina Ekholm), Workshop on Empirical Research in International Trade and Investment, Copenhagen, June 1998.

"Non-Profits and Price-Fixing: The Case of the Ivy League", Department of Justice Antitrust Division, April 1998.

"Non-Profits and Price-Fixing: The Case of the Ivy League", American Economics Association Meetings, Chicago, January 1998.

Discussant ("Equilibrium under Satisficing," by Ralph W. Pfouts), International Atlantic Economics Society, ASSA Meetings, Chicago, January 1998.

Discussant ("Overseas Investments and Firm Exports," by Keith Head and John Ries), Fourth Annual Empirical Investigations in International Trade conference, Purdue University, November 1997.

"Maximum or Minimum Differentiation? An Empirical Investigation into the Location of Firms", International Atlantic Economic Association Conference, Philadelphia, October 1997.

Discussant ("Antidumping Enforcement in a Reciprocal Model of Dumping: Theory and Evidence," Taiji Furusawa and Thomas J. Prusa) and session chair, Third Annual Empirical Investigations in International Trade conference, Purdue University, November 1996.

"The Effect of Price-Fixing by Institutions of Higher Education", Indiana University-Purdue University Indianapolis, April 1996.

"Exercising Market Power in Proprietary Aftermarkets", with Severin Borenstein and Jeffrey K. MacKie-Mason, Indiana University - Purdue University - IUPUI First Tri-School Conference, March 1996.

"All in the Family: Family, Income, and Labor Force Attachment", with Jon D. Haveman, American Economic Association Meetings, San Francisco, January 1996.

"Family Matters: Unemployment, Wage Changes, and Mobility", with Jon D. Haveman, Southern Economics Association Meetings, New Orleans, November 1995.

Discussant and session chair, Second Annual Empirical Investigations in International Trade conference, Purdue University, November 1995.

"Competition and Anti-Competitive Behavior", ICLE (The State Bar of Michigan) Conference on Antitrust and Intellectual Property, July 1995.

"Price-Fixing, Tuition, and Financial Aid", Midwest Economics Association Meetings, Cincinnati, April 1995.

"Family Matters: Unemployment, Wage Changes, and Mobility," Midwest Economics Association Meetings, Cincinnati, April 1995.

Discussant and session chair, "Customer Discrimination, Entrepreneurial Decisions, and Investment", Midwest Economics Association Meetings, April 1995.

"An Empirical Test of the Effect of Basis Risk on Cash Market Positions", University of Illinois, Urbana-Champaign, February 1995.

Discussant and session chair, First Annual Empirical Investigations in International Trade conference, Purdue University, November 1994.

"Antitrust Policy in Aftermarkets", with Severin Borenstein and Jeffrey K. MacKie-Mason, FTC/DOJ/ABA Conference on Post-Chicago Economics, Washington, D.C., May 1994.

"The Effect of Price-Fixing by Institutions of Higher Education, University of Delaware, May 1994.

"The Effect of Futures Markets and Corners on Storage and Spot Price Variability", Purdue University, February 1994.

"An Empirical Test of the Effect of Basis Risk on Cash Market Positions", University of California at Davis, February 1993.

Discussant, Econometrics Association, Anaheim, 1992 Annual Meetings.

"Testing the Principle of Minimum Differentiation: Airline Departure-Time Crowding", Econometrics Association, Washington, D.C., 1990 Annual Meetings.

Consulting and Testifying

In re Cathode Ray Tube (CRT) Antitrust Litigation
United States District Court, Northern District of California, San Francisco Division, No. CV-07-5944-SC
Testifying expert for plaintiffs
Deposed November 2012, March 2013, June 2014, July 2014

In re Photochromic Lens Antitrust Litigation, 2010-2012
United States District Court Middle District of Florida, Tampa Division, No. 8:10-md-02173-JDW-EAJ
Testifying expert for plaintiffs
Deposed August 2012

Datel Holdings and Datel Design and Development v. Microsoft, 2010-2011
United States District Court, Northern District of California, San Francisco Division, No. 09-cv-05535
Testifying expert for plaintiffs
Deposed October 2011

In re Prefilled Propane Tank Marketing and Sales Practices Litigation, 2010-2011
United States District Court, Western District of Missouri, Western Division, No. 4:09-cv-00465
Testifying expert for plaintiffs

In re Florida Cement and Concrete Antitrust Litigation, 2010
United States District Court, Southern District of Florida, Miami Division, No. 1:09-cv-23493-CMA
Consulting expert for plaintiffs

Altair Engineering v. MSC Software, 2009-2010
United States District Court, Eastern District of Michigan, Southern Division, No. 2:07-cv-12807
Testifying expert for plaintiffs
Deposed May 2010

In re Optical Disk Drive products Antitrust Litigation, 2009-2010
United States District Court, Northern District of California, San Francisco Division, No. M:2010-cv-02143
Consulting expert for plaintiffs

In re Flash Memory Antitrust Litigation, 2008-2011
United States District Court, Northern District of California, Oakland Division, No. C-07-0086-SBA
Testifying expert for plaintiffs
Deposed August 2009

Valassis Communications, Inc. v. News America, Inc., 2008-2009
United States District Court, Eastern District of Michigan, Southern Division, No. 2:06-cv-10240
Circuit Court of the State of Michigan, County of Wayne, No. 07-0706645-CZ
Consulting expert for plaintiffs

In re TFT-LCD (Flat Panel) Antitrust Litigation, 2008-present
United States District Court, Northern District of California, San Francisco Division, No. M:07-cv-01827
Testifying expert for plaintiffs
Deposed July 2009, June 2011, August 2011

Houston Baptist University v. NCAA, 2008-2009
United States District Court in and for the Southern District of Texas, Houston Division
Testifying expert for plaintiffs

Seoul Semiconductor Co. v. Nichia Corp., 2008
United States District Court, Northern District of California, No. 3:08-cv-04932-PJH
Testifying expert for plaintiffs

Albert Andy Cohn v. Office Depot, 2008
Superior Court of the State of California, County of Los Angeles, Central District, No. BC 372449
Testifying expert for defendants

In re Graphics Processing Units Antitrust Litigation, 2007-2008
United States District Court Northern District of California, No. M:07-CV-01826-WHA
Testifying expert for plaintiffs
Deposed June 2008

Pro-Sys Consultants Ltd. and Neil Godfrey v. Microsoft, 2007-present
Supreme Court of British Columbia, No. L043175, Vancouver Registry
Testifying expert for plaintiffs
Deposed December 2008

In re Dynamic Random Access Memory (DRAM) Antitrust Litigation, 2007
United States District Court, Northern District of California, No. 02-cv-01486
Consulting expert for plaintiffs

Jason White et al. v. NCAA, 2006-2008
United States District Court Central District of California, No. CV 06-0999 RGK (MANx)
Testifying expert for plaintiffs
Deposed October 2007

In re Reformulated Gasoline (RFG) Antitrust and Patent Litigation, 2004-2008
United States District Court Central District of California, No. 05-1671 CAS
Testifying expert for plaintiffs
Deposed December 2006

Carlisle, settlement negotiations with Crompton, EPDM price-fixing cartel, 2005-2007
Consulting expert

Caterpillar and Carlisle, settlement negotiations with DuPont-Dow Elastomers, PCP (or CR) and EPDM price-fixing cartels, 2004-2005
Consulting expert

City and County of San Francisco et al. v. Microsoft, 2004-present
United States District Court for the District of Maryland, No. 1332
Testifying expert for plaintiffs

The Service Source v. Office Depot, 2004-2005
United States District Court Eastern District of Michigan Southern Division, No. 02-73361
Project director

Joe Comes et al. v. Microsoft, 2002-2008
Iowa District Court for Polk County, No. CL82311
Testifying expert for plaintiffs
Deposed July 2006, November 2006

Charles Cox et al. v. Microsoft, 2002-2006
Supreme Court of the State of New York County of New York, No. 105193/00
Testifying expert for plaintiffs

Daniel Gordon et al. v. Microsoft, 2002-2004
State of Minnesota District Court County of Hennepin Fourth Judicial District, No. 00-5994
Testifying expert for plaintiffs
Deposed September 2003

Morelock Enterprises, Inc. v. Weyerhaeuser Co., 2004-2008
United States District Court District of Oregon, No. 3:04-cv-00583-PA
Testifying expert for plaintiffs
Deposed October 2004, April 2005, October 2007
Testified in trial April 2008

Compuware v. IBM, 2002-2005
United States District Court for the Eastern District of Michigan, No. 02-70906
Project director

In re New Mexico Indirect Purchaser Microsoft Corp. Antitrust Litigation, 2002-2004
State of New Mexico First Judicial District, No. D-0101-CV-2000-1697
Testifying expert for plaintiffs

Charles Friedman et al. v. Microsoft, 2002-2004
Superior Court of the State of Arizona in and for the County of Maricopa, No. CV2000-000722 / CV2000-005872
Testifying expert for plaintiffs
Deposed September 2003

In re Massachusetts Consumer Protection Litigation, 2003-2004
Commonwealth of Massachusetts, Superior Court Department of the Trial Court Middlesex Division, No. 00-2456
Consulting expert

Olson v. Microsoft, 2002
Montana First Judicial District Court Lewis & Clark County, No. CDV-2000-219
Consulting expert

Covad v. Bell Atlantic (Verizon), 2001-2004
United District Court for the District of Columbia, No. 99-1046
Project director

AMD, 2000-2004
Project director

Leckrone, et al. v. Premark International, Inc., et al., 2001
Testifying expert for plaintiffs

Ren, et al. v. EMI Music Distribution, Inc., 2001
State of Michigan in the Circuit Court of the County of Macomb, No. 00-2383-CZ
Testifying expert for plaintiffs

SBC, 2000
Staff economist

Lingo et al. v. Microsoft, 1999-2004
Superior Court of the State of California City and County of San Francisco, J.C.C.P. No. 4106
Project director

Gravity et al. v. Microsoft, 1999-2003
United States District Court for the District of Columbia, No. 1:99CV00363
Staff economist

City and County of San Francisco, 1999
Staff economist

Intergraph v. Intel, 1998-2001
United States District Court Appeals for the Federal District, No. 98-1308
Staff economist

Comm-Tract v. Northern Telecom, 1991-1997
United States District Court District of Massachusetts, No. 90-13088-WF
Project director

Systemcare, Inc. v. Wang Computer, 1991-1993
United States District Court for the District of Colorado, No. 89-B-1778
Staff economist

International Travel Arrangers v. Northwest Airlines, 1988-1989
Staff economist

Exhibit B: Documents Considered in the Expert Report of Janet S. Netz, PH.D.
Part 1: Bates Numbered Documents

BMCC-CRT000142063
CHU00082287
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TAEC-CRT-00091750
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Exhibit B: Documents Considered in the Expert Report of Janet S. Netz, PH.D.
Part 1: Bates Numbered Documents

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TSB-CRT-00035366
TSB-CRT-00036524
TSB-CRT-00036533
TSB-CRT-00036534
TSB-CRT-00039829
TSB-CRT-00042610

Exhibit B: Documents Considered in the Expert Report of Janet S. Netz, PH.D.
Part 2: Confidential Documents without Bates Numbers

01 July 2014, Videotaped Deposition of W.R. Kim, Volume I.

01 May 2014, Videotaped Deposition of Target 30(b)(6) Witness Nikhil Nayar, Volume I.

02 July 2014, Videotaped Deposition of W.R. Kim, Volume II.

02 May 2014, Videotaped Deposition of Target 30(b)(6) Witness Nikhil Nayar, Volume II.

04 September 2014, Videotaped Deposition of Janusz A. Ordover, PH.D.

05 August 2014, Certificate of Service, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

05 August 2014, Certificate of Service, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

05 August 2014, Certificate of Service, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

05 August 2014, Opposition Expert Report of Lawrence Wu, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

05 September 2014, Deposition of Janet Netz, PH.D.

05 September 2014, Videotaped Deposition of Janusz A. Ordover, PH.D.

08 August 2014, Videotaped Deposition of Paul Anthony Garcia.

08 May 2014, Deposition of Chih-Yen Hsu, Volume I.

08 September 2014, Videotaped Deposition of Daniel L. Rubinfeld, PH.D.

09 June 2014, Videotaped Deposition of Kris Mortier.

09 May 2014, Deposition of Chih-Yen Hsu, Volume II.

10 July 2014, Videotaped Deposition of Alan S. Frankel, PH.D.

10 June 2014, Continued Videotaped Deposition of Kris Mortier.

10 June 2014, Deposition of Mohan Rao, PH.D.

11 July 2014, Videotaped Deposition of Lawrence Wu, PH.D.

11 September 2014, Deposition of Edward Snyder, PH.D.

12 December 2012, Deposition of In Hwan Song, Volume I.

12 November 2003, Deposition of Thomas P. Pohmer.

12 September 2014, Deposition of Barry Harris, PH.D.

12 September 2014, Videotaped Deposition of Lawrence Wu, PH.D.

13 August 2014, Deposition of Jeffrey Johnson, Volume I.

13 December 2012, Deposition of In Hwan Song, Volume II.

Exhibit B: Documents Considered in the Expert Report of Janet S. Netz, PH.D.
Part 2: Confidential Documents without Bates Numbers

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Pass-Through Study Summary Results

Third Party Name	Distribution Chain Level	Product	Begin Date	End Date	Number of Tubes in Study	Pass-through Rate	Significance (Rate = 100%)	R-Squared	Standard Error of Pass-through Rate
Amazon	Internet Retailer	Monitors	1/2/2002	11/16/2011	19,847	104%	= 100%	0.98	0.02
Amazon	Internet Retailer	Televisions	2/8/2002	1/7/2011	20,591	117%	> 100%	0.97	0.01
Arrow Electronics	Product Distributor	Monitors	11/24/1997	6/26/2006	70,703	109%	> 100%	0.97	0.00
BenQ	Product Manufacturer	Monitors	11/2/1998	9/21/2005	5,037,064	112%	> 100%	0.95	0.00
Best Buy	Brick & Mortar Retailer	Monitors	4/8/1996	3/22/2009	13,939,131	110%	> 100%	0.91	0.00
Best Buy	Brick & Mortar Retailer	Televisions	4/8/1996	12/27/2009	39,584,133	124%	> 100%	0.96	0.00
Best Buy.com	Internet Retailer	Monitors	8/18/2000	12/29/2007	110,200	138%	> 100%	0.95	0.00
Best Buy.com	Internet Retailer	Televisions	6/12/2000	12/31/2007	451,463	144%	> 100%	0.98	0.00
Buy.com	Internet Retailer	Monitors	1/13/2002	1/28/2010	473	116%	> 100%	0.99	0.03
Buy.com	Internet Retailer	Televisions	9/27/2002	9/6/2010	575	105%	> 100%	0.99	0.01
CDW	Internet Retailer	Monitors	1/3/2006	1/8/2008	53,063	100%	= 100%	0.93	0.02
CDW	Internet Retailer	Televisions	11/8/2005	3/29/2010	5,721	102%	= 100%	0.98	0.03
Costco	Brick & Mortar Retailer	Monitors	12/16/1996	3/11/2006	569,177	107%	> 100%	0.99	0.00
Costco	Brick & Mortar Retailer	Televisions	9/3/1996	12/8/2007	7,325,920	107%	> 100%	0.99	0.00
Dell	Internet Retailer	Monitors	1/2/2002	12/31/2006	2,739,263	118%	> 100%	0.92	0.00
Dell (Purchase Costs)	Internet Retailer	Monitors	1/2/2002	12/31/2006	2,716,596	122%	> 100%	0.92	0.00
Envision	Product Manufacturer	Monitors	1/3/2001	5/27/2008	1,377,421	100%	> 100%	0.79	0.00
Fry's	Brick & Mortar Retailer	Monitors	1/1/1998	10/21/2006	1,205,681	113%	> 100%	0.97	0.00
Funai	Product Manufacturer	Televisions	1/3/2005	7/28/2009	10,958,577	113%	> 100%	0.97	0.00
Gateway	Internet Retailer	Monitors	1/5/1998	12/30/2004	N/A*	112%	> 100%	0.98	0.01
Ingram Micro	Product Distributor	Monitors	12/31/2001	12/27/2010	2,646,928	102%	> 100%	1.00	0.00
Ingram Micro	Product Distributor	Televisions	12/31/2001	12/7/2010	4,960	103%	> 100%	1.00	0.01
Kmart	Brick & Mortar Retailer	Televisions	11/25/2004	11/19/2009	1,314,151	115%	> 100%	0.94	0.00
OfficeMax	Brick & Mortar Retailer	Desktops	1/26/2003	12/1/2008	90,747	109%	> 100%	0.79	0.03
OfficeMax	Brick & Mortar Retailer	Monitors	1/26/2003	9/25/2007	231,354	101%	> 100%	0.77	0.01
PC Connection	Internet Retailer	Monitors	7/8/1999	10/29/2008	23,101	109%	> 100%	0.98	0.01
PC Connection	Internet Retailer	Televisions	2/5/1999	1/8/2007	232	106%	> 100%	1.00	0.02
PC Mall	Internet Retailer	Desktops	6/6/2002	3/7/2006	5,638	101%	= 100%	0.95	0.01

Third Party Name	Distribution Chain Level	Product	Begin Date	End Date	Number of Tubes in Study	Pass-through Rate	Significance (Rate = 100%)	R-Squared	Standard Error of Pass-through Rate
PC Mall	Internet Retailer	Monitors	2/27/1994	6/18/2009	159,587	110%	> 100%	0.98	0.00
PC Mall	Internet Retailer	Televisions	9/24/1996	11/19/2009	2,001	112%	> 100%	0.99	0.02
P.C. Richard	Brick & Mortar Retailer	Televisions	3/1/1995	11/27/2007	2,819,216	120%	> 100%	0.94	0.00
Philips	Product Manufacturer	Monitors	6/1/2000	8/1/2007	2,425,995	110%	> 100%	0.95	0.02
Philips	Product Manufacturer	Televisions	2/1/2000	5/1/2009	20,975,642	106%	> 100%	0.94	0.01
RadioShack	Brick & Mortar Retailer	Monitors	1/1/2002	7/4/2009	165,233	108%	> 100%	0.84	0.00
RadioShack	Brick & Mortar Retailer	Televisions	1/1/2002	2/29/2008	1,016,643	105%	> 100%	0.88	0.00
Sam's Club (Retail Prices)	Brick & Mortar Retailer	Televisions	8/13/2001	11/19/2005	17,939	98%	= 100%	1.00	0.02
Sam's Club (Transaction Prices)	Brick & Mortar Retailer	Televisions	9/8/2001	12/17/2005	15,871	113%	> 100%	0.98	0.03
Sanyo	Product Manufacturer	Televisions	12/1/1994	7/1/2007	N/A*	150%	> 100%	0.96	0.12
Sears	Brick & Mortar Retailer	Monitors	1/5/1999	12/28/2005	769,667	100%	= 100%	0.71	0.01
Sears	Brick & Mortar Retailer	Televisions	1/5/1999	1/14/2009	13,418,767	128%	> 100%	0.94	0.00
Sharp Electronics	Product Manufacturer	Televisions	10/1/1997	11/1/2007	11,496,675	104%	= 100%	0.90	0.03
Target (Retail Prices)	Brick & Mortar Retailer	Televisions	5/1/2005	10/1/2009	805,388	117%	> 100%	0.99	0.04
Target (Transaction Prices)	Brick & Mortar Retailer	Televisions	5/1/2005	10/1/2009	805,388	121%	> 100%	0.98	0.09
Tatung	Product Manufacturer	Monitors	9/2/1998	10/31/2006	222,516	100%	= 100%	0.93	0.01
Tech Data	Product Distributor	Monitors	11/3/1997	10/29/2007	1,217,901	100%	> 100%	0.99	0.00
Toshiba America Consumer Products (TACP)	Product Manufacturer	Televisions	4/12/1995	3/31/2006	20,313,733	117%	> 100%	0.97	0.00
Toshiba America Electronics Corporation	Tube Distributor	CDTs	4/23/1994	6/28/2000	1,854,536	96%	= 100%	0.99	0.02
Toshiba America Electronics Corporation	Tube Distributor	CPTs	4/27/1994	11/22/2002	12,188,332	100%	> 100%	1.00	0.00
Toshiba America Information Systems	Product Manufacturer	Monitors	11/1/1996	4/1/2005	327,738	112%	= 100%	0.78	0.14
ViewSonic	Product Manufacturer	Monitors	4/16/1997	10/31/2001	1,109,928	118%	> 100%	0.96	0.00
Wal-Mart (Retail Prices)	Brick & Mortar Retailer	Televisions	6/23/2001	8/7/2010	48,156	110%	> 100%	0.99	0.05
Wal-Mart (Transaction Prices)	Brick & Mortar Retailer	Televisions	6/25/2001	8/7/2010	47,141	106%	> 100%	0.99	0.02
Wal-Mart/Sanyo	Brick & Mortar Retailer	Televisions	12/1/1994	8/3/2009	N/A*	116%	> 100%	1.00	0.01
Zones	Internet Retailer	Desktops	1/3/2000	4/1/2003	7,175	113%	> 100%	0.97	0.01

Third Party Name	Distribution Chain Level	Product	Begin Date	End Date	Number of Tubes in Study	Pass-through Rate	Significance (Rate = 100%)	R-Squared	Standard Error of Pass-through Rate
Zones	Internet Retailer	Monitors	1/3/2000	1/11/2008	41,368	104%	> 100%	0.97	0.00
Envision - Ingram Micro - PC Connection	Multi-level	Monitors	1/15/2002	11/19/2005	**	127%	= 100%	0.00	0.25
Philips - Best Buy	Multi-level	Televisions	6/1/2000	7/1/2006	***	139%	> 100%	0.00	0.07
Philips - Costco	Multi-level	Televisions	6/1/2000	2/1/2007	****	133%	> 100%	0.00	0.07
Panasonic - Best Buy.com	Top-and-bottom	Televisions	6/12/2000	4/6/2007	15,551	115%	> 100%	0.73	0.06
Samsung - Best Buy	Top-and-bottom	Televisions	1/1/1998	12/1/2007	2,402,442	155%	> 100%	0.86	0.01
Sanyo - Wal-Mart	Top-and-bottom	Televisions	12/1/1994	7/1/2007	N/A*	185%	> 100%	0.95	0.19
Sanyo - Wal-Mart	Top-to-bottom	Televisions	12/1/1994	7/1/2007	N/A*	176%	> 100%	0.00	0.16
Toshiba	Top-to-bottom	Televisions	9/3/1996	3/31/2006	*****	183%	> 100%	0.00	0.00

Note(s): Unless otherwise noted, the number of observations is weighted by the transaction quantity. Studies that are not weighted by transaction quantity are Gateway, Wal-Mart/Sanyo, and the Sanyo - Wal-Mart top-and-bottom and top-to-bottom studies.
Where possible, I also conduct pass-through studies on desktop computers that are all-in-one computers featuring a built-in CRT monitor, or that are bundled with CRT monitors.
Cost data is generally produced in two forms: synchronized with the sales data, or separate from the sales data. Synchronized cost data appear in the sales data as a separate field and does not need to be matched with sales data.
When costs and prices (i.e. purchases and sales) are not synchronized, I calculate average costs for each product over a certain time (generally daily or weekly average costs).
Studies combining Wal-Mart and Sanyo data use price lists of Sanyo products sold in Wal-Mart stores. The price variable is Wal-Mart's retail price, and the cost variable is FOB costs from products sold by Sanyo Manufacturing Corporation to Wal-Mart.
The columns Begin Date and End Date represent the oldest and most recent dates for all observations in each study.
All pass-through studies except Toshiba America Electronics Corporation and PC Connection (televisions) are run with robust standard errors, i.e. I conducted a Breusch-Pagan test for heteroskedasticity and this rejected the null hypothesis of no heteroskedasticity. The Toshiba America Electronics Corproration studies use standard errors that allow for clustering (correlation between observations within each cluster).
* The data used for these studies do not contain quantity information for a tube count.
** The Envision - Ingram Micro - PC Connection study involves 12,641 tubes at the Envision level, 324 tubes at the Ingram Micro level, and 307 tubes at the PC Connection level.
*** The Philips - Best Buy study involves 1,655,162 tubes at at the Philips level and 1,587,196 tubes at the Best Buy level.
**** The Philips - Costco study involves 890,557 tubes at the Philips level and 822,079 tubes at the Costco level.
***** The Toshiba top-to-bottom study involves 6,035,699 tubes at theTAEC level, 280,337 tubes at the TACP level, and 1,291,761 tubes at the Costco level.

Source File(s): See Exhibit RR-71.

Pass-Through Study Explanatory Variable List

Third Party Name	Distribution Chain Level	Product	Price Description	Cost Description	Cost	Size	Brand	Resolution	Flat Screen	HDTV	VCR Combo	DVD Combo	Time	Other Explanatory Variables
Amazon	Internet Retailer	Monitors	Transaction Prices	Synchronized	X	X	X	X						
Amazon	Internet Retailer	Televisions	Transaction Prices	Synchronized	X	X	X			X		X		
Arrow Electronics	Product Distributor	Monitors	Transaction Prices	Synchronized	X	X		X						
BenQ	Product Manufacturer	Monitors	Transaction Prices	Synchronized	X	X		X						
Best Buy	Brick & Mortar Retailer	Monitors	Transaction Prices	Synchronized	X	X			X					Wide screen.
Best Buy	Brick & Mortar Retailer	Televisions	Transaction Prices	Synchronized	X	X			X	X	X	X		Wide screen; HD-ready; Picture-in-picture.
Best Buy.com	Internet Retailer	Monitors	Transaction Prices	Synchronized	X	X	X		X					
Best Buy.com	Internet Retailer	Televisions	Transaction Prices	Synchronized	X	X	X		X	X	X	X		Wide screen; HD-ready; Picture-in-picture; Slim tube.
Buy.com	Internet Retailer	Monitors	Transaction Prices	Synchronized	X	X	X	X	X					
Buy.com	Internet Retailer	Televisions	Transaction Prices	Synchronized	X	X	X		X	X	X	X		
CDW	Internet Retailer	Monitors	Transaction Prices	Monthly Average	X	X		X	X					
CDW	Internet Retailer	Televisions	Transaction Prices	Monthly Average	X	X	X		X	X	X	X		
Costco	Brick & Mortar Retailer	Monitors	Transaction Prices	Weekly Average	X	X	X		X					
Costco	Brick & Mortar Retailer	Televisions	Transaction Prices	Weekly Average	X	X	X		X	X	X	X		Wide screen; HD-ready; Picture-in-picture.
Dell	Internet Retailer	Monitors	Transaction Prices	Synchronized	X	X		X						
Dell (Purchase Costs)	Internet Retailer	Monitors	Transaction Prices	Weekly Average	X	X		X						
Envision	Product Manufacturer	Monitors	Transaction Prices	Synchronized	X	X			X					Speakers.
Fry's	Brick & Mortar Retailer	Monitors	Transaction Prices	Synchronized	X	X	X		X					Refurbished.
Funai	Product Manufacturer	Televisions	Transaction Prices	Monthly Average	X	X	X		X		X	X		
Gateway	Internet Retailer	Monitors	List Prices	Daily Average	X	X								
Ingram Micro	Product Distributor	Monitors	Transaction Prices	Synchronized	X	X		X	X					
Ingram Micro	Product Distributor	Televisions	Transaction Prices	Synchronized	X	X			X	X				Wide screen.
Kmart	Brick & Mortar Retailer	Televisions	Transaction Prices	Weekly Average	X	X	X		X	X	X	X		
OfficeMax	Brick & Mortar Retailer	Desktops	Transaction Prices	Synchronized	X									RAM; Hard Drive Size; Processor Type; Processor Speed; Condition Type; Distribution Channel
OfficeMax	Brick & Mortar Retailer	Monitors	Transaction Prices	Synchronized	X	X			X					Condition Type; Distribution Channel.

Third Party Name	Distribution Chain Level	Product	Price Description	Cost Description	Cost	Size	Brand	Resolution	Flat Screen	HDTV	VCR Combo	DVD Combo	Time	Other Explanatory Variables
PC Connection	Internet Retailer	Monitors	Transaction Prices	Weekly Average	X	X	X	X	X					Refurbished.
PC Connection	Internet Retailer	Televisions	Transaction Prices	Weekly Average	X	X	X			X				HD-ready.
PC Mall	Internet Retailer	Desktops	Transaction Prices	Weekly Average	X									RAM; Processor Speed; Retailer (PC Mall, Trend)
PC Mall	Internet Retailer	Monitors	Transaction Prices	Weekly Average	X	X		X	X					Refurbished; Retailer (PC Mall, Trend, SX)
PC Mall	Internet Retailer	Televisions	Transaction Prices	Weekly Average	X	X			X	X	X	X		Retailer (PC Mall, Trend)
P.C. Richard	Brick & Mortar Retailer	Televisions	Transaction Prices	Synchronized	X	X	X			X	X	X		HD-ready.
Philips	Product Manufacturer	Monitors	Monthly Average Price	Monthly Average	X	X			X					
Philips	Product Manufacturer	Televisions	Monthly Average Price	Monthly Average	X	X			X	X	X	X		
RadioShack	Brick & Mortar Retailer	Monitors	Transaction Prices	Synchronized	X	X	X		X					
RadioShack	Brick & Mortar Retailer	Televisions	Transaction Prices	Synchronized	X	X	X		X		X	X		
Sam's Club (Retail Prices)	Brick & Mortar Retailer	Televisions	Weekly Average Price	Weekly Average	X	X	X				X			
Sam's Club (Transaction Prices)	Brick & Mortar Retailer	Televisions	Transaction Prices	Weekly Average	X	X	X				X		Month	
Sanyo	Product Manufacturer	Televisions	List Prices	Monthly Average	X	X			X	X				Picture-in-picture.
Sears	Brick & Mortar Retailer	Monitors	Transaction Prices	Synchronized	X	X	X							
Sears	Brick & Mortar Retailer	Televisions	Transaction Prices	Synchronized	X	X	X				X	X		
Sharp Electronics	Product Manufacturer	Televisions	Monthly Average Price	Monthly Average	X	X			X		X	X		
Target (Retail Prices)	Brick & Mortar Retailer	Monitors	Monthly Average List F	Monthly Average	X	X			X		X	X		
Target (Transaction Prices)	Brick & Mortar Retailer	Monitors	Monthly Average Price	Monthly Average	X	X			X		X	X		
Tatung	Product Manufacturer	Monitors	Transaction Prices	Monthly Average	X	X		X					Year	Color Display
Tech Data	Product Distributor	Monitors	Transaction Prices	Monthly Average	X	X		X	X					Speakers; Unbranded (generic).
Toshiba America Consumer Products (TACP)	Product Manufacturer	Televisions	Transaction Prices	Synchronized	X	X				X	X			
Toshiba America Electronics Corporation	Tube Distributor	CDTs	Transaction Prices	Monthly Average	X									Model Number
Toshiba America Electronics Corporation	Tube Distributor	CPTs	Transaction Prices	Monthly Average	X									Model Number

Third Party Name	Distribution Chain Level	Product	Price Description	Cost Description	Cost	Size	Brand	Resolution	Flat Screen	HDTV	VCR Combo	DVD Combo	Time	Other Explanatory Variables
Toshiba America Information Systems	Product Manufacturer	Monitors	Monthly Average Price	Monthly Average	X	X								Remanufactured; Obsolete; Discounted; Limited; Product Line; Multimedia; Casing Color
ViewSonic	Product Manufacturer	Monitors	Transaction Prices	Weekly Average	X	X			X					Multimedia.
Wal-Mart (Retail Price	Brick & Mortar Retailer	Televisions	Weekly Average Price	Weekly Average	X	X	X			X	X			
Wal-Mart (Transactior	Brick & Mortar Retailer	Televisions	Transaction Prices	Weekly Average	X	X	X			X	X		Month	
Wal-Mart/Sanyo	Brick & Mortar Retailer	Televisions	List Prices	FOB Costs	X	X			X	X				Wide screen, Picture-in-picture.
Zones	Internet Retailer	Desktops	Transaction Prices	Synchronized	X									RAM; Processor Speed
Zones	Internet Retailer	Monitors	Transaction Prices	Synchronized	X	X	X	X	X					
Envision - Ingram Mic	Multi-level	Monitors	Weekly Average Price	Weekly Average	X	X								
Philips - Best Buy	Multi-level	Televisions	Monthly Average Price	Monthly Average	X	X			X					
Philips - Costco	Multi-level	Televisions	Monthly Average Price	Monthly Average	X	X			X					
Panasonic - Best Buy	Top-and-bottom	Televisions	Transaction Prices	Monthly Average	X	X			X		X	X		Picture-in-picture.
Samsung - Best Buy	Top-and-bottom	Televisions	Transaction Prices	Monthly Average	X	X			X	X	X			
Sanyo - Wal-Mart	Top-and-bottom	Televisions	List Prices	Monthly Average	X	X			X	X				Picture-in-picture.
Sanyo - Wal-Mart	Top-to-bottom	Televisions	List Prices	Monthly Average	X	X			X	X				Picture-in-picture.
Toshiba	Top-to-bottom	Televisions	Transaction Prices	Monthly Average	X	X			X		X			Wide screen; Picture-in-picture.

Note(s): Cost data is generally produced in two forms: synchronized with the sales data, or separate from the sales data.
When costs and prices (i.e. purchases and sales) are not synchronized, I calculate average costs for each product over a certain time (generally daily or weekly average costs).
Where possible, I also conduct pass-through studies on desktop computers that are all-in-one computers featuring a built-in CRT monitor, or that are bundled with CRT monitors.
The Wal-Mart/Sanyo studies use price lists of Sanyo products sold in Wal-Mart stores. The price variable is Wal-Mart's retail price, and the cost variable is FOB costs from products sold by Sanyo Manufacturing Corporation to Wal-Mart.

Source File(s): See Exhibit RR-71.

Pass-Through Stata File List

Study Name	Stata Program Names
Amazon	Import Amazon Specs.do amazon_data_cleaning.do amazon_report.do
Arrow	arrow_data_cleaning.do arrow_report.do
BenQ	benq_customer_list.do benq_data_cleaning.do benq_report.do
Best Buy	bestbuy_sku_list.do bestbuy_data_load.do bestbuy_20100128_production_load.do bestbuy_20121024_production_load.do bestbuy_data_cleaning.do bestbuy_report.do
Best Buy.com	bestbuy_com_data_load.do bestbuy_com_data_clean.do bestbuy_com_report.do
Buy.com	Import BuyCom Digests.do ReadSKUs.do buycom_data_cleaning.do buycom_report.do
CDW	cdw_data_cleaning.do cdw_report.do
Costco	costco_data_load.do costco_data_cleaning.do costco_report.do
Dell	dell_data_cleaning.do dell_report.do
Envision	envision_data_cleaning.do envision_report.do
Fry's	frys_data_cleaning.do frys_report.do
Funai	funai_data_cleaning.do funai_report.do
Gateway	gateway_data_cleaning.do gateway_report.do
Ingram Micro	ingram_micro_data_load.do ingram_micro_data_cleaning.do ingram_micro_report.do
Kmart	kmart_data_load.do kmart_data_clean.do kmart_report.do

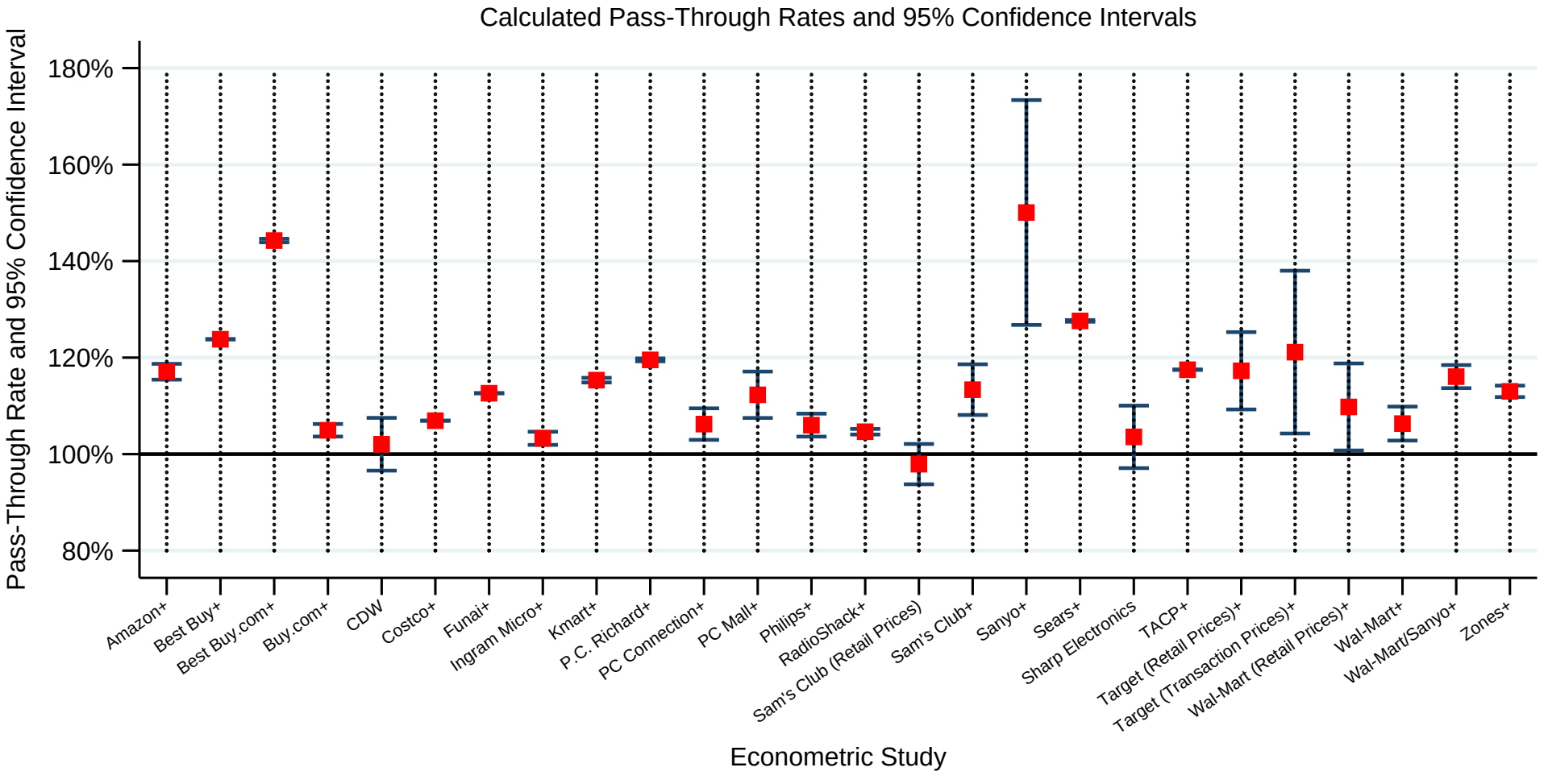
Study Name	Stata Program Names
OfficeMax	item_selection.do officemax_data_cleaning.do officemax_report.do
PC Connection	pcconnection_data_cleaning.do pcconnection_report.do
PC Mall	pcmall_data_cleaning.do pcmall_report.do
P.C. Richard	pcr_data_cleaning.do pcr_report.do
Philips	philips_data_load.do philips_data_clean.do philips_report.do
RadioShack	radioshack_data_load.do radioshack_data_clean.do radioshack_report.do
Sam's Club (Retail Prices)	selected_stores.do selected_items.do additional_wm_sams_skus.do sams_retail_prices.do sams_retail_prices_report.do
Sam's Club (Transaction Prices)	selected_stores.do selected_items.do additional_wm_sams_skus.do sams_data_cleaning.do sams_report.do
Sanyo	sanyo_data_combine.do sanyo_combined_report.do
Sears	sears_data_load.do sears_data_clean.do sears_add_date.do sears_report.do
Sharp Electronics	sharp_data_cleaning.do sharp_report.do
Target (Retail and Transaction Prices)	target_data_clean.do target_report.do
Tatung	tatung_costs.do tatung_sales.do tatung_report.do
Tech Data	techdata_data_cleaning.do techdata_report.do
Toshiba America Consumer Products (TACP)	tacp_sales_load.do tacp_sales_clean.do tacp_report.do
Toshiba America Electronic Components (TAEC)	taec_data_load.do taec_report.do

Study Name	Stata Program Names
Toshiba America Information Systems (TAIS)	tais_sales.do tais_report.do
ViewSonic	viewsonic_data_cleaning.do viewsonic_report.do
Wal-Mart (Retail Prices)	selected_stores.do selected_items.do additional_wm_sams_skus.do walmart_retail_prices.do walmart_retail_prices_report.do
Wal-Mart (Transaction Prices)	selected_stores.do selected_items.do additional_wm_sams_skus.do walmart_data_cleaning.do walmart_report.do
Wal-Mart/Sanyo	sanyo_data_cleaning.do sanyo_report.do
Zones	zones_item_selection.do zones_data_cleaning.do zones_report.do
Multi-Level: Envision - Ingram Micro - PC Connection	envision_data_cleaning.do ingram_micro_data_load.do ingram_micro_data_cleaning.do pcc_clean_ingram_envision_only.do envision_im_pcc_merge.do envision_im_pcc_report.do
Multi-Level: Philips - Best Buy	bestbuy_sku_list.do bestbuy_data_load.do bestbuy_20100128_production_load.do bestbuy_20121024_production_load.do bestbuy_data_cleaning.do philips_data_load.do philips_data_clean.do philips_bestbuy_load_clean.do philips_bestbuy_report.do
Multi-Level: Philips - Costco	costco_data_load.do costco_philipsonly_clean.do philips_data_load.do philips_data_clean.do philips_costco_clean.do philips_costco_report.do
Top-and-Bottom: Panasonic - Best Buy.com	bestbuy_com_data_load.do bestbuy_com_data_clean.do MTPD-0122906.do panasonic_bestbuy_com_TAB_clean.do panasonic_bestbuy_com_TAB_report.do

Study Name	Stata Program Names
Top-and-Bottom: Samsung - Best Buy	bestbuy_sku_list.do bestbuy_data_load.do bestbuy_20100128_production_load.do bestbuy_20121024_production_load.do bestbuy_data_cleaning.do SDCRT-0083119.2.do samsung_bestbuy_tab_load.do samsung_bestbuy_tab_clean.do samsung_bestbuy_tab_report.do
Top-and-Bottom: Sanyo - Wal-Mart	sanyo_data_cleaning.do sanyo_data_combine.do sanyo_combined_report.do
Top-to-Bottom: Sanyo - Wal-Mart	sanyo_data_cleaning.do sanyo_data_combine.do sanyo_combined_report.do
Top-to-Bottom: Toshiba	taec_data_load.do tacp_sales_load.do tacp_sales_clean.do costco_data_load.do costco_data_cleaning.do toshiba_top_to_bottom.do

Note(s): Programs are listed in the order they should be run.

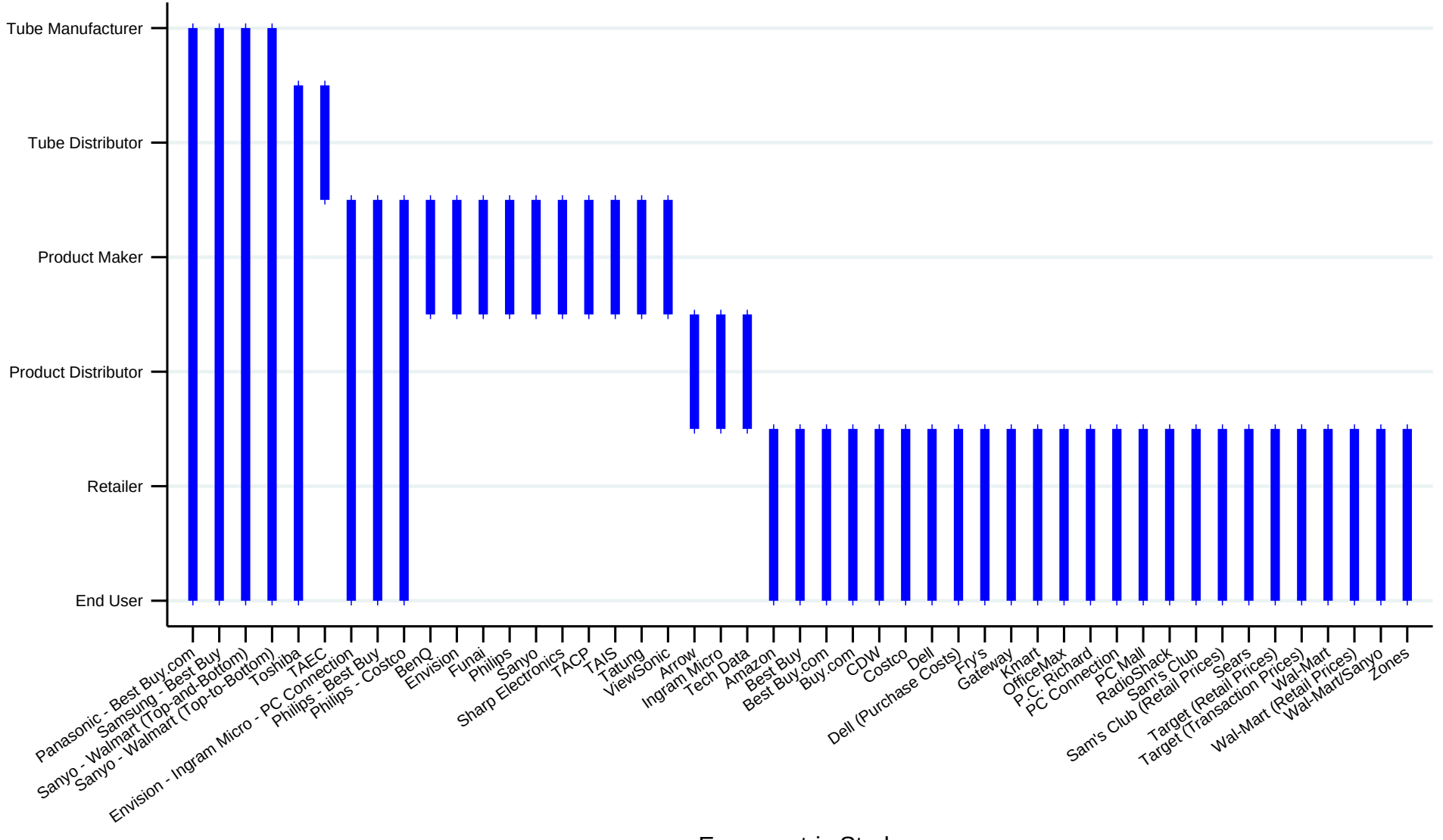
Television Pass-Through



Note(s): + The pass-through rate is statistically greater than 100%.
Source File(s): See Exhibit RR-71.

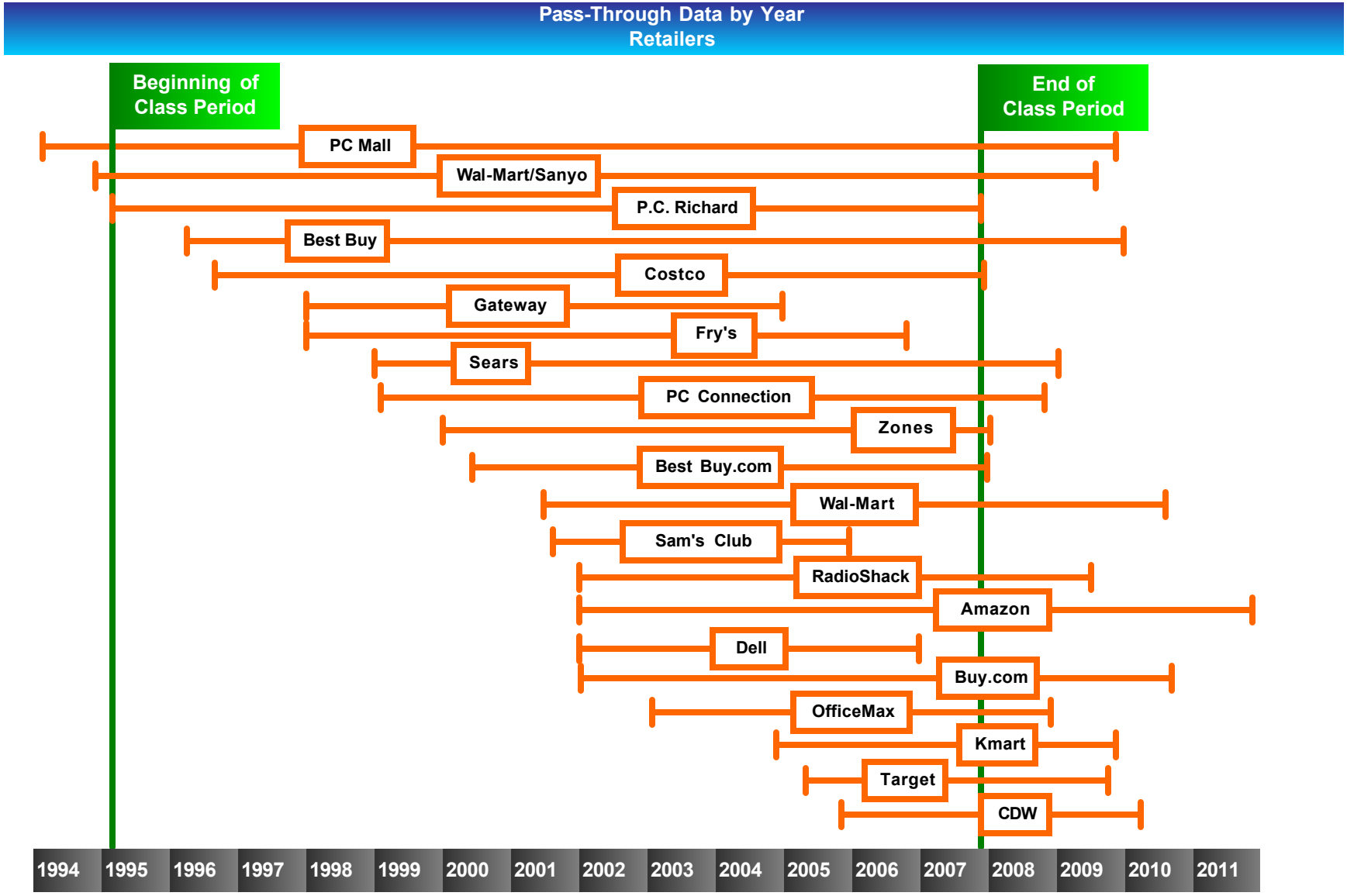
Exhibit RR-73

Pass-Through Studies Channel Coverage



Source File(s): See Exhibit RR-71.

Exhibit RR-75



Source File(s): See Exhibit RR-71.

Exhibit RR-76

1995 - 1996 Cartel Meetings/Communications

DATE	CHU	LG	DW	SDI	HIT	MAT	MIT	TSB	PHS	LPD	MTPD	TCRT	BMCC	IRI	SMTL	TAT	THOM	BEG BATES
2/14/1995		X	X	X														SDCRT-0086208
3/13/1995			X	X														SDCRT-0086211
3/17/1995 - 3/18/1995	X	X	X	X					X									CHU00028565
3/22/1995	X			X														CHU00028877
Before 5/29/1995		X		X														CHU00028933
5/29/1995	X	X																CHU00028933
6/29/1995	X			X														CHU00028874
7/17/1995	X			X														CHU00028873
8/16/1995	X			X														CHU00028869 CHU00021791
8/23/1995	X			X														CHU00028868
9/6/1995					X	X		X										CHU00028311
9/7/1995	X							X										CHU00028311
9/18/1995	X			X														CHU00028865
9/19/1995	X			X														CHU00028853
Before 9/22/1995				X				X										CHU00028305
9/22/1995	X							X										CHU00028305
10/5/1995	X	X		X														CHU00028856
11/8/1995	X			X														SDCRT-0086213
12/4/1995	X						X											CHU00028558
12/5/1995	X	X																CHU00028930
12/6/1995	X			X														CHU00028848
Before or on 1/17/1996				X	X													HDP-CRT00025646
2/2/1996	X			X														CHU00028841
2/9/1996	X							X										CHU00028302
2/12/1996	X			X														SDCRT-0086219
3/4/1996	X		X															CHU00028972
3/19/1996	X			X														CHU00028817 SDCRT-0086220
4/15/1996	X			X														CHU00028815
4/18/1996	X			X														CHU00028811
4/23/1996	X					X												CHU00028524
4/29/1996	X							X										CHU00028300
5/6/1996	X					X												CHU00028521
5/7/1996	X			X														CHU00028813
5/17/1996	X		X															CHU00028970
5/17/1996	X			X														CHU00028809
5/24/1996	X		X															CHU00028968
6/10/1996	X			X														CHU00028805
6/10/1996	X			X														CHU00028807

DATE	CHU	LG	DW	SDI	HIT	MAT	MIT	TSB	PHS	LPD	MTPD	TCRT	BMCC	IRI	SMTL	TAT	THOM	BEG BATES
6/12/1996	X	X																CHU00028912
6/12/1996	X						X											CHU00028551
6/17/1996	X							X										CHU00028297
7/17/1996	X					X												CHU00028516
7/19/1996	X							X										CHU00028295
8/21/1996	X			X														CHU00028803
9/4/1996	X							X										CHU00028293
9/11/1996	X			X														CHU00028789
9/19/1996				X		X												SDCRT-0086217
9/23/1996	X				X													CHU00028400
10/2/1996	X			X														CHU00028801
10/3/1996	X							X										CHU00028289
10/4/1996	X								X									CHU00032071
10/9/1996	X							X										CHU00028291
10/17/1996		X	X	X														SDCRT-0086221
10/21/1996	X			X														CHU00028799
10/22/1996	X								X									CHU00032064
10/22/1996	X			X														CHU00028796
10/24/1996	X	X																CHU00028909 CHU00032068
10/30/1996	X					X												CHU00028514
11/14/1996	X			X														CHU00028794
11/21/1996	X						X											CHU00028548
11/21/1996	X				X													CHU00028398
Before 11/23/1996	X			X	X													CHU00028786
11/23/1996	X		X	X														CHU00028791
11/25/1996	X			X	X													CHU00028396
11/25/1996		X	X	X														SDCRT-0086224
11/26/1996	X			X														CHU00028776
12/2/1996	X			X														CHU00028781
12/6/1996	X			X														SDCRT-0086227
12/18/1996	X			X														CHU00028773

Pre-MTPD Panasonic (Matsushita) and BMCC Cartel Meetings/Communications

DATE	CHU	LG	DW	SDI	HIT	MAT	MIT	TSB	PHS	LPD	MTPD	TCRT	BMCC	IRI	SMTL	TAT	THOM	BEG BATES
9/6/1995					X	X		X										CHU00028311
4/23/1996	X					X												CHU00028524
5/6/1996	X					X												CHU00028521
7/17/1996	X					X												CHU00028516
9/19/1996				X		X												SDCRT-0086217
10/30/1996	X					X												CHU00028514
1/9/1997	X					X												CHU00028508
Before 3/4/1997				X		X												CHU00028507
3/4/1997	X					X												CHU00028507
3/12/1997	X	X	X	X	X	X			X									CHU00028755 CHU00028758
Week prior to 4/9/1997				X		X												CHU00028505
4/9/1997				X		X												SDCRT-0086230 @ 6236-6237
4/9/1997	X					X												CHU00028505
4/23/1997	X					X												CHU00028503
5/23/1997	X					X												CHU00028501
7/9/1997	X					X												CHU00028499
9/12/1997	X					X												CHU00028497
10/13/1997	X					X												CHU00028495
10/15/1997	X					X												CHU00028493
11/7/1997	X					X												CHU00028490
11/10/1997						X											X	TCE-CRT 0021822
12/24/1997	X					X												CHU00028487
1/16/1998	X					X												CHU00028482
1/19/1998	X					X												CHU00028451
2/11/1998	X					X												CHU00028475
3/20/1998	X					X												CHU00028472
4/15/1998	X					X												CHU00028469
5/27/1998	X					X												CHU00028467
7/3/1998	X					X												CHU00028465
7/16/1998				X		X												SDCRT-0086416
8/5/1998	X			X					X				X	X				CHU00030661
8/25/1998	X					X												CHU00028463
9/4/1998	X	X	X	X					X				X	X				CHU00030665
9/15/1998	X					X												CHU00028461
9/26/1998	X					X												CHU00006362
10/15/1998	X					X												CHU00028459
11/5/1998					X	X												HDP-CRT00023360
11/6/1998	X		X	X					X				X	X				CHU00030684

DATE	CHU	LG	DW	SDI	HIT	MAT	MIT	TSB	PHS	LPD	MTPD	TCRT	BMCC	IRI	SMTL	TAT	THOM	BEG BATES
12/7/1998					X	X												HDP-CRT00023353 HDP-CRT00023354
12/11/1998	X					X												CHU00028457
1/30/1999	X					X												CHU00028453
2/2/1999	X	X	X	X					X				X	X				CHU00030705
4/2/1999	X		X	X					X				X	X				CHU00030734 CHU00030741 CHU00030745
4/25/1999		X		X		X												SDCRT-0086748
6/4/1999	X		X	X					X				X	X				CHU00030777
6/28/1999	X					X												CHU00030795
7/15/1999				X		X												SDCRT-0086503
7/20/1999	X					X												CHU00028449 CHU00028447 CHU00030803
7/29/1999	X					X												CHU00028436
8/5/1999	X		X	X					X				X	X				CHU00030819
Before 8/23/1999				X									X					CHU00029179
9/7/1999	X					X												CHU00028438
9/14/1999	X					X												CHU00028441
9/15/1999	X					X												CHU00028439
10/1/1999	X					X												CHU00028432
10/12/1999	X			X					X				X	X				CHU00030881
11/2/1999				X		X												SDCRT-0086554
11/9/1999					X	X												MTPD-0016566
11/10/1999	X					X												CHU00028435 CHU00030887
12/9/1999	X			X					X				X	X				CHU00030941
12/13/1999	X					X												CHU00028434
12/21/1999				X		X												SDCRT-0086517
1/3/2000						X		X										MTPD-0016566
1/21/2000						X			X									MTPD-0212628
3/2/2000						X		X										MTPD-0016566
3/23/2000	X					X												CHU00028430
3/28/2000				X		X												SDCRT-0087314
4/6/2000	X	X	X	X					X				X	X				CHU00030992
4/13/2000						X											X	TCE-CRT 0020460 TCE-CRT 0020461
5/2/2000	X					X												CHU00028427
5/9/2000						X			X									JLJ-00003477
5/9/2000	X	X	X	X					X				X	X				CHU00031002
5/19/2000						X			X									PHLP-CRT-082631
6/5/2000						X		X										MTPD-0016566
6/8/2000				X		X												SDCRT-0087324
6/8/2000	X					X												CHU00028425

DATE	CHU	LG	DW	SDI	HIT	MAT	MIT	TSB	PHS	LPD	MTPD	TCRT	BMCC	IRI	SMTL	TAT	THOM	BEG BATES
6/9/2000	X	X	X	X					X				X	X				CHU00031018
6/21/2000	X					X												CHU00028424
6/28/2000				X		X												SDCRT-0087324
8/11/2000	X	X	X	X					X				X	X				CHU00031040
8/29/2000						X			X									MTPD-0212628
8/30/2000				X		X												SDCRT-0087381
9/14/2000	X	X	X	X					X				X	X				CHU00031044
11/9/2000	X	X	X	X					X				X	X				CHU00031088
11/29/2000				X		X												SDCRT-0087331
2/7/2001						X			X									MTPD-0212628
2/22/2001	X	X		X					X				X	X				CHU00031105 CHU00031107
Before or on 02/23/2001					X	X												HDP-CRT00049280
6/6/2001	X					X												CHU00031137
6/12/2001	X												X					CHU00031140
8/29/2001						X											X	TCE-CRT 0013094 TCE-CRT 0013096
10/9/2001				X		X												SDCRT-0087683
1/11/2002						X				X							X	PHLP-CRT-095492
Before or on 4/19/2002				X		X												MTPD-0426017
Before or on 5/9/2002						X											X	TCE-CRT 0021804
6/13/2002						X		X										MTPD-0024384
Before 6/17/2002						X				X								PHLP-CRT-052964
7/30/2002				X		X												SDCRT-0087926
8/8/2002				X		X												MTPD-0220066
8/15/2002						X											X	MTPD-0223790
Before or on 10/16/2002				X		X												SDCRT-0007266
11/7/2002						X				X								JLJ-00001901
11/22/2002				X		X												MTPD-0023243
12/27/2002				X		X												SDCRT-0006670 MTPD-0222756
2/24/2003				X		X												SDCRT-0007282
2/26/2003	X					X												CHU00020661 CHU00030080
3/7/2003				X		X												MTPD-0025531
3/10/2003				X		X												SDCRT-0002585
3/13/2003				X		X												MTPD-0025531

Note(s): MTPD was officially created on April 1, 2003.

Pre-MTPD Toshiba Cartel Meetings/Communications

DATE	CHU	LG	DW	SDI	HIT	MAT	MIT	TSB	PHS	LPD	MTPD	TCRT	BMCC	IRI	SMTL	TAT	THOM	BEG BATES
9/6/1995					X	X		X										CHU00028311
9/7/1995	X							X										CHU00028311
Before 9/22/1995				X				X										CHU00028305
9/22/1995	X							X										CHU00028305
2/9/1996	X							X										CHU00028302
4/29/1996	X							X										CHU00028300
6/17/1996	X							X										CHU00028297
7/19/1996	X							X										CHU00028295
9/4/1996	X							X										CHU00028293
10/3/1996	X							X										CHU00028289
10/9/1996	X							X										CHU00028291
1/10/1997	X							X										CHU00028287
2/27/1997	X							X										CHU00028286
3/12/1997	X	X	X	X				X				X						CHU00020779 CHU00020782
4/7/1997	X							X										CHU00028283
5/7/1997				X				X										SDCRT-0086241
5/27/1997	X							X										CHU00028279
5/27/1997				X				X										SDCRT-0086245
7/4/1997	X							X										CHU00028281
Before 7/16/1997				X				X										CHU00028277
7/16/1997	X							X										CHU00028277
8/29/1997	X							X										CHU00028275
9/29/1997	X							X										CHU00028273
10/6/1997	X							X										CHU00028267 CHU00028269
11/12/1997 - 11/13/1997								X									X	TCE-CRT 0021822
1/14/1998	X							X										CHU00028263
1/20/1998	X							X										CHU00028260
3/11/1998	X							X										CHU00028257
4/14/1998	X							X										CHU00028254
5/18/1998	X							X										CHU00028252
7/3/1998	X							X										CHU00028250
8/20/1998	X							X										CHU00028248
10/15/1998	X							X										CHU00028245
12/7/1998						X		X										HDP-CRT00023353 HDP-CRT00023354
12/16/1998	X							X										CHU00028265
Before or on 1/12/1999				X				X	X								X	SDCRT-0002526
1/22/1999	X							X										CHU00028240

DATE	CHU	LG	DW	SDI	HIT	MAT	MIT	TSB	PHS	LPD	MTPD	TCRT	BMCC	IRI	SMTL	TAT	THOM	BEG BATES
2/23/1999	X							X										CHU00028241
3/6/1999	X	X	X	X				X	X									TSB-CRT-00036875
5/6/1999	X							X										CHU00028238
5/7/1999					X			X										CHU00028238
7/28/1999	X							X										CHU00028236 CHU00030805
Before 8/23/1999			X					X										CHU00029179
9/15/1999	X							X										CHU00028234 CHU00030851
9/29/1999	X							X										CHU00028228
10/20/1999	X							X										CHU00028229
11/5/1999	X							X										CHU00028231
12/31/1999	X							X										CHU00029039
1/3/2000						X		X										MTPD-0016566
Before 1/21/2000			X	X				X										TSB-CRT-00042440
3/2/2000	X							X										CHU00030971
3/2/2000						X		X										MTPD-0016566
3/3/2000				X				X										SDCRT-0005813
3/6/2000	X							X										CHU00028224 CHU00028215
3/10/2000	X							X										CHU00028218 CHU00028227
3/21/2000	X							X										CHU00028213
4/13/2000		X						X										TSB-CRT-00042493
4/14/2000								X									X	TCE-CRT 0020460 TCE-CRT 0020461
5/4/2000	X							X										CHU00028221 CHU00030999
5/15/2000		X						X										TSB-CRT-00041620
5/16/2000								X	X									PHLP-CRT-082631
6/5/2000						X		X										MTPD-0016566
6/9/2000	X							X										TSB-CRT-00039414 TSB-CRT-00039415 CHU00028209
6/12/2000								X	X									TSB-CRT-00039414 TSB-CRT-00039415
7/6/2000	X							X										CHU00028211
8/2/2000	X							X										CHU00028207 CHU00031036
8/28/2000				X				X										SDCRT-0087377
9/28/2000	X							X										CHU00028204 CHU00031047
Between 10/12/2000 and 10/20/2000				X				X										SDCRT-0087389

DATE	CHU	LG	DW	SDI	HIT	MAT	MIT	TSB	PHS	LPD	MTPD	TCRT	BMCC	IRI	SMTL	TAT	THOM	BEG BATES
10/24/2000				X				X										TSB-CRT-00041721
10/25/2000		X						X										TSB-CRT-00042610
1/12/2001	X							X										CHU00031095
1/15/2001				X				X										TSB-CRT-00041746
1/19/2001				X				X										SDCRT-0087675
3/5/2001	X							X										CHU00028202 CHU00031110
Before 3/20/2001			X					X										CHU00031113
4/20/2001	X							X										CHU00028203
5/22/2001								X									X	TCE-CRT 0013708 TCE-CRT 0013710
7/4/2001	X		X	X				X		X								TSB-CRT-00035348 TSB-CRT-00035350
7/25/2001 - 7/26/2001								X		X								JLJ-00003167
7/26/2001	X							X										CHU00031153
8/22/2001								X		X								TSB-CRT-00035366
8/29/2001				X				X										HDP-CRT00026189
8/29/2001								X									X	TCE-CRT 0013711 TCE-CRT 0013712
9/7/2001								X									X	TCE-CRT 0020868 TCE-CRT 0020869 TCE-CRT 0020870 TCE-CRT 0020871 TCE-CRT 0013713
9/10/2001								X									X	TCE-CRT 0013716 TCE-CRT 0013717 TCE-CRT 0013719
10/11/2001				X				X										SDCRT-0069086
11/16/2001								X									X	TCE-CRT 0013722 TCE-CRT 0013724
1/9/2002					X			X										HDP-CRT00026227
1/11/2002								X									X	TCE-CRT 0020863 TCE-CRT 0020864 TCE-CRT 0020865 TCE-CRT 0020866 TCE-CRT 0020867
1/21/2002								X									X	TCE-CRT 0013725 TCE-CRT 0013727
1/22/2002								X									X	TCE-CRT0013728
Before 1/29/2002	X							X										TAEC-CRT-00089968
Before 2/7/2002								X									X	TCE-CRT 0023943
2/25/2002				X				X										TSB-CRT-00041862
Before or on 4/18/2002					X			X										HDP-CRT00051407

DATE	CHU	LG	DW	SDI	HIT	MAT	MIT	TSB	PHS	LPD	MTPD	TCRT	BMCC	IRI	SMTL	TAT	THOM	BEG BATES
4/18/2002				X				X										TSB-CRT-00041870
Before 4/19/2002				X				X		X								PHLP-CRT-012646
Before 5/9/2002								X									X	TCE-CRT 0021804
5/27/2002				X				X		X								PHLP-CRT-014272 PHLP-CRT-014141
6/13/2002						X		X										MTPD-0024384
Before 6/17/2002								X		X								PHLP-CRT-052964
6/18/2002								X									X	TCE-CRT0013746
6/28/2002								X									X	TCE-CRT 0022861 TCE-CRT 0022862
7/2/2002								X									X	TCE-CRT 0020858 TCE-CRT 0020859 TCE-CRT 0020860 TCE-CRT 0020861
8/12/2002				X				X										SDCRT-0087928
9/13/2002	X			X				X		X		X						CHU00030414
10/15/2002								X									X	TCE-CRT 0020855 TCE-CRT 0020856 TCE-CRT 0020857
10/17/2002	X		X	X				X		X		X						CHU00030410 SDCRT-0087932
11/6/2002								X		X								JLJ-00001901
11/25/2002					X			X										HDP-CRT00026077
12/6/2002				X				X		X								SDCRT-0087934
12/17/2002	X			X				X		X		X						SDCRT-0087938 CHU00030559
2/10/2003				X				X		X								SDCRT-0088705
2/21/2003	X							X		X		X						CHU00020660 CHU00030070 CHU00030557
2/24/2003 - 2/27/2003				X				X										SDCRT-0007282
2/28/2003	X							X										CHU00020661 CHU00030080 CHU00030553
Before or on 3/5/2003								X		X								JLJ-00001928

Note(s): MTPD was officially created on April 1, 2003.

Hitachi Cartel Meetings/Communications

DATE	CHU	LG	DW	SDI	HIT	MAT	MIT	TSB	PHS	LPD	MTPD	TCRT	BMCC	IRI	SMTL	TAT	THOM	BEG BATES
9/6/1995					X	X		X										CHU00028311
Before or on 1/17/1996				X	X													HDP-CRT00025646
9/23/1996	X				X													CHU00028400
11/21/1996	X				X													CHU00028398
Before 11/23/1996	X			X	X													CHU00028786
11/25/1996	X			X	X													CHU00028396 CHU00028784
1/10/1997	X				X													CHU00028394
3/12/1997	X	X	X	X	X	X			X									CHU00028755 CHU00028758
4/29/1997	X				X													CHU00028393
3/13/1998					X		X											HDP-CRT00025601
5/14/1998					X												X	HEDUS-CRT00002107
7/13/1998					X				X									PHLP-CRT-081748
8/21/1998	X				X													CHU00028385
10/13/1998					X												X	HEDUS-CRT00160563
11/5/1998					X	X												HDP-CRT00023360
11/20/1998	X				X													CHU00028383
1/6/1999					X				X									HEDUS-CRT00098394 @ 8394-8395
1/7/1999					X				X									HEDUS-CRT00166472 HEDUS-CRT00098394 @ 8399-8400
1/7/1999					X												X	HEDUS-CRT00098394 @ 8396
3/8/1999				X	X													HDP-CRT00056170
4/21/1999					X				X									HEDUS-CRT00152273
Before 6/23/1999				X	X													CHU00030787
11/9/1999					X	X												MTPD-0016566
2/22/2000	X				X													CHU00028382
1/29/2000					X		X											HDP-CRT00025965
4/11/2000	X				X													CHU00028380
5/17/2000					X				X									PHLP-CRT-082631
6/16/2000	X				X													CHU00031028 CHU00028377
7/3/2000				X	X													HDP-CRT00051354
7/18/2000	X				X													CHU00028376
Before 9/21/2000		X			X													CHU00031051
9/20/2000					X				X									CHU00031051
10/22/2000					X									X				HDP-CRT00042019

DATE	CHU	LG	DW	SDI	HIT	MAT	MIT	TSB	PHS	LPD	MTPD	TCRT	BMCC	IRI	SMTL	TAT	THOM	BEG BATES
11/1/2000					X												X	HEDUS-CRT00161617 HEDUS-CRT00161619
11/3/2000	X				X													CHU00028374
12/13/2000				X	X													HDP-CRT00023436
Before or on 2/23/2001					X	X												HDP-CRT00049280
3/7/2001					X				X									HEDUS-CRT00004705
3/16/2001				X	X													HDP-CRT00049348 HDP-CRT00004468
3/??/2001					X				X									HEDUS-CRT00162777
4/14/2001				X	X													HDP-CRT00048694 HDP-CRT00004468
4/27/2001				X	X													HDP-CRT00023467 HDP-CRT00023468
5/14/2001					X												X	TCE-CRT 0020912 TCE-CRT 0020913
5/24/2001				X	X													HDP-CRT00049291
5/30/2001				X	X													HDP-CRT00048797
Before or on 6/11/2001					X				X									PHLP-CRT-090736
6/22/2001				X	X													HDP-CRT00026180 HDP-CRT00004468
7/24/2001				X	X													HEDUS-CRT00162931
8/29/2001				X	X													HDP-CRT00026189
9/4/2001				X	X													HDP-CRT00026197
9/4/2001					X												X	TCE-CRT 0022672
9/13/2001				X	X													HDP-CRT00051298
10/4/2001				X	X													HDP-CRT00049201
11/29/2001				X	X													HDP-CRT00051340
12/17/2001				X	X													SDCRT-0087437
1/9/2002					X			X										HDP-CRT00026227
1/18/2002				X	X													HDP-CRT00049440
Before or on 2/4/2002				X	X													HDP-CRT00049449
2/8/2002				X	X													HDP-CRT00026234
3/26/2002				X	X													HDP-CRT00049313
3/28/2002				X	X													HDP-CRT00056188
Before or on 4/18/2002					X			X										HDP-CRT00051407
Before or on 5/13/2002				X	X													HDP-CRT00049470
8/17/2002	X				X													HDP-CRT00037711
10/8/2002					X	X												MTPD-0224010
11/25/2002					X			X										HDP-CRT00026077
3/12/2003					X			X										HDP-CRT00026082

DATE	CHU	LG	DW	SDI	HIT	MAT	MIT	TSB	PHS	LPD	MTPD	TCRT	BMCC	IRI	SMTL	TAT	THOM	BEG BATES
6/26/2003					X						X							HDP-CRT00024172 HDP-CRT00024173 HDP-CRT00024174
7/17/2003					X						X							HDP-CRT00026313
5/26/2005					X						X							MTPD-0479804 MTPD-0479805

Note(s): This list does not include conspiracy activity on the part of Hitachi's partially-owned SEG-Hitachi subsidiary in Shenzhen, China.

Meetings with Quarterly Target Prices

DATE	BEG BATES
9/4/1996	CHU00028293
4/16/1997	SDCRT-0086238
9/7/1998	CHU00030670
9/26/1998	CHU00029262
11/24/1998	SDCRT-0086485
3/7/1999	CHU00029245
4/9/1999	CHU00028606
4/15/1999	SDCRT-0086545
5/10/1999	CHU00029228
6/21/1999	CHU00029185
8/23/1999	CHU00029179
9/13/1999	CHU00029065
10/26/1999	SDCRT-0086703
10/27/1999	CHU00029171
11/25/1999	CHU00029163
1/24/2000	CHU00029152
4/14/2000	CHU00029138
9/18/2000	SDCRT-0087312
1/26/2001	SDCRT-0087662
3/20/2001	CHU00031113
5/17/2001	SDCRT-0087667
6/26/2001	CHU00036414
7/24/2001	CHU00036384
10/15/2001	CHU00660366
11/20/2001	CHU00036408
12/21/2001	CHU00036390
1/18/2002	CHU00036392
2/22/2002	CHU00036394
3/20/2002	CHU00125166
4/22/2002	CHU00660436
5/28/2002	SDCRT-0007588
9/13/2002	CHU00030414
12/6/2002	SDCRT-0087934
4/22/2003	CHU00123742

DATE	BEG BATES
4/25/2003	SDCRT-0088713
5/22/2003	SDCRT-0088715
7/24/2003	MTPD-0580741
7/25/2003	SDCRT-0088720
9/5/2003	SDCRT-0088732
11/7/2003	SDCRT-0088738
11/21/2003	SDCRT-0088635
11/28/2003	MTPD-0580741
12/4/2003	SDCRT-0088675
2/12/2004	MTPD-0580737
2/16/2004	MTPD-0607571
5/6/2004	MTPD-0580751
6/1/2004	CHU00125374
6/18/2004	MTPD-0580775
9/13/2004	MTPD-0607598
11/5/2004	SDCRT-0090197
12/1/2004	SDCRT-0003084
12/28/2004	MTPD-0400578
2/9/2005	SDCRT-0091491
2/13/2005	MTPD-0580798
2/25/2005	CHU00029987
3/15/2005	SDCRT-0091353
3/22/2005	SDCRT-0002984
4/29/2005	CHU00732816
6/9/2005	MTPD-0400597
6/30/2005	MTPD-0400573
8/5/2005	MTPD-0400554
9/22/2005	CHU00548418
9/26/2005	MTPD-0423645
10/21/2005	CHU00030468
12/6/2005	SDCRT-0091400
12/12/2005	MTPD-0580821
3/9/2006	CHU00124103
9/5/2006	MTPD-0479714

Meeting Notes Showing Network of Communication Between Cartel Members

Text	Citation
From a meeting between Chunghwa, Samsung, and Orion: “CPT [Chunghwa] and SDD [Samsung] together persuaded HTC [Hitachi] from continue damaging the order of market price… Furthermore, ORION proposed and hoped that it could be arranged for various CRT to participate together at the next meeting, to engage in frank dialogue and to solve problems together. CPT would invite PH [Philips] to participate, and ORION assured that it would invite TSB [Toshiba] to attend; SDD was responsible for inviting LG and HTC.”	Lu, Jing-Song (Jason), 23 November 1996, Sales & Marketing Division Visiting Report, CHU00028786 - CHU00028788, at 8788E.
From a meeting between Chunghwa, Samsung, Philips, Orion, and LG: “Regarding the price for 15" of the Japanese, attendees have to notify TSB/MEC respectively (CPT will make the contact), HTC (SDD will try to notify) will follow suit to avoid unsynchronized March, causing it to fall short of final completion.”	Chunghwa Picture Tubes, LTD, 19 March 1997, Customer Contact Report, Main Contents 14"/15" CDT Price Opinion Exchange, CHU00028749 - CHU00028751, at 8750E.
From a meeting between Chunghwa and Matsushita: “MEC claimed that currently its supply prices are 14": 55, 15":82~83, 17": about 180 on average. CPT indicated that currently the main 14" suppliers CPT/SDD/PH already have a common understanding not to keep competing viciously. Guard the bottom line of USD 58.00. Please pass on to BMCC for coordination.”	CPT, Du, Ching-Yuan (Michael), et al., 13 October 1997, Customer Contact Report, CHU00028495 - CHU00028496, at 8496E.
From a meeting between Chunghwa, Samsung, Philips, Orion, and LG: “Visited Matsushita July 16 as the representative of Japanese cathode ray tube (CRT) representative and provided information on the agreements reached by 5 Korean and Taiwan companies [bullet] Expressed their intention to participate actively [bullet] Caution against ANTITRUST LAWS.”	Samsung SDI, 18 July 1998, 7th CDT Industry Meeting (July 18) Results, SDCRT-0086416 - SDCRT-0086418, at 6417E.
From a meeting between Chunghwa and Matsushita: “Currently, Matsushita has made an overall announcement to its customers that the new price will be implemented effective December 1st, and asked that the customers' orders/L/C to be issued at the new price, but none of the customers accepted. Matsushita is currently persisting; December shipments to Taiwanese makers have not yet been made, in addition, although TSB also announced 17" CDT price increase to the customers, but after the customers' resistance, the shipments in December to major customers such as ADI/MAG etc. were shipped by using the old price first, and ask for the price differential (?) back from the customers after the overall price increase has succeeded. In addition, HTC increases have been fragmented, MEC headquarter is coordinating with HTC personnel now, it is believed that it will be clarified by next week. Assistant Manager Hsu said this time it was announced to the customers that the scale of increase will be USD 10.00/pc, but actual scale of increase is USD 7.00/pc.”	CPT, Wen-Chun (Tony) Cheng, et al., 11 December 1998, Sales Department Customer Contact Report, CHU00028457 - CHU00028458, at 8457E.
From a meeting between Chunghwa, Samsung, Orion, and LG: “LG and OEC will contact TDDI (TSB Indonesia) and ask TDDI to FLW the price agreement.”	Chunghwa Picture Tubes, LTD, 10 May 1999, Business Meeting Report, Subject Review of Q3 TV tube price, CHU00029228 - CHU00029230, at 9229.01E.
From a meeting between Chunghwa, Samsung, Philips, Orion, and LG: “Major agreements… To integrate the communication lines with the Japanese companies (Philips) in order to transmit the industry atmosphere and to induce participation [bullet] If the Japanese companies do not increase their prices, the CDT price of the 5 companies will be equal/greater than the CDT prices of the 5 Japanese companies, so the participation of the Japanese companies is important”.	Samsung SDI, 08 March 1999, CDT Industry (March of ’99) Meeting Results, SDCRT-0086563 - SDCRT-0086566, at 6563E.

Text	Citation
From a meeting between Chunghwa, Samsung, Orion, LG, and Thai-CRT: “1) TSB Indonesia issue: Mr. Moon said that TSB has in fact Delayed implementing the price increase in Indonesia, and that although he has spoken to TSB personnel over the phone, up until today, he has not had the chance to speak to high-level management in person and will be arranging for himself and Mr. HK Cho to meet with high-level TSB managers to persuade TSB to follow up on Indonesia prices. 2) IRICO: Mr. Moon said that he and Director Liu of CPT have communicated twice with IRICO and that IRICO has agreed to raise its 14" ITC prices from the original USD 26 to USD 29-30. However, because PH's current price is only USD 32.5 (returning to FOB Asia Price of around USD 26-27), the price increase is being delayed. Senior Manager Cheng explained that CPT has pushed PH on numerous occasions to increase prices by at least October, but PH is still concerned about Orion/CPT/IRICO's prices, so CPT and Orion's Mr. Moon will continue to communicate with PH and Push.”	Chunghwa Picture Tubes, LTD, 23 August 1999, Visitation Report (Submit), CHU00029179 - CHU00029184, at 9179.01E - 9179.02E.
From a meeting between Chunghwa, Samsung, Orion, LG, and Thai-CRT: “[bullet] Low price still offering (IRICO, Samtel, Philips Brazil, Ekranas, etc.) The attendees agreed with SDD Mr. Inn Kim’s proposal to approach the above-mentioned CRT manufacturers who have been destroying the market price with low-price competition and provide these manufacturers with timely updates on the market situation on demand and price information in order to convince them to follow suit. Division of labor among each maker is as follows: [sub-bullet] CPT → IRICO [sub-bullet] SDD → BMCC, PH Brazil [sub-bullet] OEC → TSB Indonesia, Ekranas [sub-bullet] LG → Samtel”.	Chunghwa Picture Tubes, LTD, 23 August 1999, Visitation Report (Submit), CHU00029179 - CHU00029184, at 9179.02E - 9180.01E.
From a meeting between Chunghwa, Samsung, Philips, Orion, and LG: “PH Mr. Jerry explained that on 1/13, after talking with Mr. Watanabe of HTC Japan Headquarters, he felt that HTC has no intention of beginning a price war. However, HTC does not believe that the Major 5 are so-called ‘sticking to bottom line pricing’ (TSB holds the same view).”	Chunghwa Picture Tubes, LTD, 24 January 2000, Visitation Report, CHU00030960 - CHU00030962, at 0960.01E.
From a meeting between Chunghwa, Samsung, Philips, Orion, LG, and Thai-CRT: “Currently in Mainland China, the prices of 21" CPT are lower than those of 20", which will seriously affect price increases. Meeting attendees are resolved to continue to ask SDI, Chunghwa Picture Tubes, and PH to strive to communicate with HTC Shenzhen, IRICO, PH Huafei, and BMCC, etc., requesting that the price of 21" tubes for direct export sales must be over $3.0/pcs higher than the price for 20" tubes.”	Chunghwa Picture Tubes, LTD, 24 March 2000, Visitation Report, Topic: Market Information Exchange and Price Review, CHU00029144 - CHU00029146, at 9144.02E.
From a meeting between Chunghwa and Hitachi: “Manager Chang claims that regarding China and Korea maker's 14"/15"/17" CDT price increase, HTC itself also intends to increase. Its headquarters' resolution is that if prices have definitely increased, HTC guarantees that it would FLW… The Japan MEC now is not up to par. TSB price is also above market price. Therefore, HTC also has the responsibility to help ensure the ability for prices to increase successfully.”	Du, Ching-Yuan (Michael), 16 June 2000, Sales Department Customer Contact Report, CHU00031028 - CHU00031030, at 1029E.

Text	Citation
From a meeting between Chunghwa and Matsushita: “CPT Tube: Director Liu explained that after China and Korea makers communicated with and explained the market status to related makers individually, of the China makers who were originally exporting the 21" tube with low prices, PH Nanjing has already increased $0.5/pcs in May. It plans to adjust another $1~2/pcs in August. HTC Shenzhen also agreed to increase the current price of Bare $48-$49/pcs, to $51/pcs in August. The price increase of 20" tubes in Southeast Asia is also very successful. Customers such as Funai/TCE/AIWA/JVC, etc. have all accepted new prices of $49/pcs or more. Prices for medium and small-size customers such as Silver are at $50/pcs. [break] Mr. Matsumoto thanked CPT for its explanation and promised to take action to announce the price increase of 20"/21" tubes to customers.”	CPT, Liu, et al., 21 June 2000, Visitation Report (Submit), CHU00028424, at 8424.01E - 8424.02E.
From a meeting between Chunghwa, Samsung, Philips, Orion, and LG: “Mr. Park of SDI, the Price leader, explained the results of discussion with TSB Indonesia: Currently, TSB supply volume for SREC 20" is 10k/m. 2Q price is $47.0/pcs. In July, price has already been adjusted by $0.5/pcs to $47.5/pcs. (GSM target price: $49.0.) Mr. Yasukawa of TSB believes that it will be difficult to increase the price again. Mr. Park of SDI proposed that because the current price from SREC's biggest supplier, TSB Indonesia, has been confirmed to be only $47.5/pcs, in order to ensure competitiveness, the original $48.0/pcs price be maintained”.	Chunghwa Picture Tubes, LTD, 21 September 2000, Visitation Report (Submit), CHU00031056 - CHU00031066, at 1056.01E.
From a meeting between Chunghwa, Samsung, Philips, Orion, and LG: “The attendees continued to request that Chairman LG Mr. Choi and HEDS personnel maintain contact and arrange meeting to communicate and transmit correct market information (representatives assigned by five makers to join the meeting), and that HEDS must FLW the price. If HEDS still insists on price competition, then the Major 5 will have Serious Countermeasure.”	Chunghwa Picture Tubes, LTD, 25 October 2000, Visit Report, CHU00031075 - CHU00031087, at 1076.02E.
From a phone call between Toshiba and Samsung: “Today, I called Executive Director D.Y. KIM of SDI to remind him of our intentions, but unfortunately, he was on a business trip to Taiwan and I could not get in touch with him. I spoke with his subordinate, General Manager J. JO (in charge of SEC) and confirmed our intentions and their situations. [break] Also, Executive Director D.Y. KIM will be working in Korea tomorrow morning, and he is supposed to give me a call tomorrow morning. [break] (1) Trends among competitors [break] 3 major makers got together in Taiwan on February 22nd (Fri). [paragraph] It was confirmed that the price increases for February and beyond were successful.”	Yamamoto, Yasuki, 25 February 2002, E-mail, Subject: Regarding SEC CDT Pricing (Confidential), TSB-CRT-00041862 - TSB-CRT-00041863, at 1862E.

Examples of Meeting Notes Discussing Large CPTs Before 2003

DATE	BEG BATES
2/14/1995	SDCRT-0086208
9/19/1996	SDCRT-0086217
10/17/1996	SDCRT-0086221
11/25/1996	SDCRT-0086224
4/9/1997	SDCRT-0086236
4/16/1997	SDCRT-0086238
5/7/1997	SDCRT-0086241
5/27/1997	SDCRT-0086245
10/15/1997	CHU00028493
12/16/1997	SDCRT-0086248
12/29/1997	SDCRT-0086253
7/13/1998	PHLP-CRT-081748
11/24/1998	SDCRT-0086485
12/21/1998	SDCRT-0086489
1/12/1999	SDCRT-0002526
3/24/1999	SDCRT-0086537
4/14/1999	CHU00029238
6/22/1999	CHU00029050
6/28/1999	JLJ-00000669
7/13/1999	CHU00030799
7/15/1999	SDCRT-0086503
7/??/1999	JLJ-00001080
10/21/1999	SDCRT-0086551
11/9/1999	MTPD-0016566
12/31/1999	CHU00029039
1/3/2000	MTPD-0016566
1/21/2000	MTPD-0212628
3/3/2000	SDCRT-0005813
3/6/2000	CHU00028224
3/14/2000	SDCRT-0005888
4/14/2000	CHU00030995
5/16/2000	PHLP-CRT-082631
5/17/2000	SDCRT-0069574
5/17/2000	PHLP-CRT-082631
5/19/2000	PHLP-CRT-082631
6/8/2000	SDCRT-0087324
6/28/2000	SDCRT-0087324

DATE	BEG BATES
7/3/2000	HDP-CRT00019426
7/11/2000	SDCRT-0005874
7/28/2000	SDCRT-0002506
7/31/2000	SDCRT-0007580
8/29/2000	MTPD-0212628
9/29/2000	SDCRT-0002488
10/25/2000	CHU00028975
1/19/2001	SDCRT-0087675
1/26/2001	SDCRT-0087662
2/7/2001	MTPD-0212628
2/15/2001	SDCRT-0087679
3/7/2001	HEDUS-CRT00000578
5/17/2001	SDCRT-0087667
6/6/2001	SDCRT-0002582
6/25/2001	SDCRT-0005856
6/26/2001	SDCRT-0005831
7/5/2001	SDCRT-0087664
8/29/2001	HDP-CRT00026189
10/11/2001	SDCRT-0069086
10/25/2001	SDCRT-0087685
11/12/2001	SDCRT-0087673
12/17/2001	SDCRT-0087437
3/18/2002	PHLP-CRT-098241
4/22/2002	CHU00030406
5/27/2002	PHLP-CRT-014272
5/28/2002	SDCRT-0007585
6/27/2002	SDCRT-0087705
7/30/2002	SDCRT-0087926
8/15/2002	MTPD-0223790
10/17/2002	SDCRT-0087932
10/25/2002	SDCRT-0087708
11/14/2002	SDCRT-0007161
11/15/2002	SDCRT-0006632
11/25/2002	SDCRT-0087719
12/6/2002	SDCRT-0087934
12/27/2002	SDCRT-0006670

Note(s): I define large CPTs as 25 inches or larger.

Target Price Regression Results - Small CPTs

Regression of Actual Prices on Target Prices

By Customer, Manufacturer, Size, and Finish

Dependent variable is Ln(Actual Price)

Variable	Coefficient	Standard Error	P-Value (two-sided)
Ln(Previous Quarter's Price)	0.439	0.053	0.000
Ln(Target Price)	0.337	0.034	0.000
Ln(Price of Glass) × Size	0.005	0.002	0.004
Ln(Industrial Production)	-0.277	0.123	0.025
Unemployment Rate	-0.025	0.007	0.001
Constant	1.751	0.689	0.011

Fixed Effects by customer, manufacturer, size, and finish

Number of observations	4,860
R-squared	0.91

Note(s): For this regression, I define small CPTs as smaller than 25 inches.

Data Source(s): Organisation for Economic Co-operation and Development, 03 January 2014, Production and Sales (MEI): Production, OECD.StatExtracts, http://stats.oecd.org/index.aspx?queryid=90#, accessed 03 January 2014.

Organisation for Economic Co-operation and Development, 03 January 2014, Key Short-Term Economic Indicators: Harmonised Unemployment Rate, OECD.StatExtracts, http://stats.oecd.org/index.aspx?queryid=21760, accessed 03 January 2014.

Bank of Korea, Undated, Glass for CRT Use.

Defendant data; see Exhibit 64 of Netz Merits Report.

Cartel meeting notes; see Target price-structure.xlsx.

Source File(s): Target price-structure.xlsx; vendor_map.xlsx; vendor_map.do; PriceTracker.do; clean_target.do; clean_defendant.do; target_price_index.do; combine_target_defendant.do; target_price_regressions_merits_rebuttal.do; target_regression_exhibits_merits_rebuttal.do; target_regression_exhibits_merits_rebuttal.xlsx

Target Price Regression Results - Large CPTs

Regression of Actual Prices on Target Prices

By Customer, Manufacturer, Size, and Finish

Dependent variable is Ln(Actual Price)

Variable	Coefficient	Standard Error	P-Value (two-sided)
Ln(Previous Quarter's Price)	0.509	0.125	0.000
Ln(Target Price)	0.505	0.153	0.001
Ln(Price of Glass) × Size	0.007	0.002	0.006
Ln(Industrial Production)	0.651	0.409	0.112
Unemployment Rate	0.041	0.051	0.415
Constant	-4.251	2.370	0.073

Fixed Effects by customer, manufacturer, size, and finish

Number of observations	1,186
R-squared	0.83

Note(s): For this regression, I define large CPTs as 25 inches or larger.

Data Source(s): Organisation for Economic Co-operation and Development, 03 January 2014, Production and Sales (MEI): Production, OECD.StatExtracts, http://stats.oecd.org/index.aspx?queryid=90#, accessed 03 January 2014.

Organisation for Economic Co-operation and Development, 03 January 2014, Key Short-Term Economic Indicators: Harmonised Unemployment Rate, OECD.StatExtracts, http://stats.oecd.org/index.aspx?queryid=21760, accessed 03 January 2014.

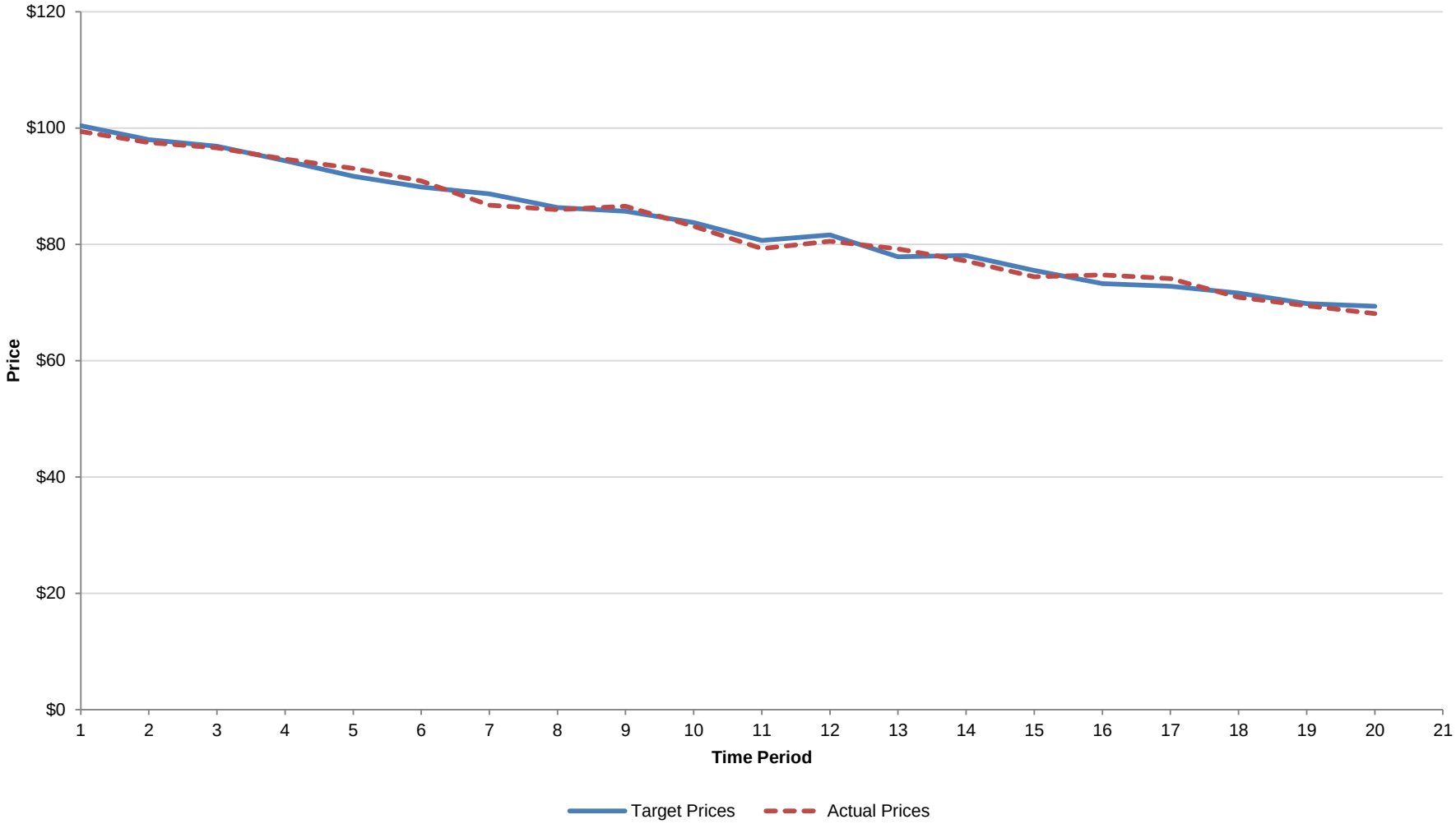
Bank of Korea, Undated, Glass for CRT Use.

Defendant data; see Exhibit 64 of Netz Merits Report.

Cartel meeting notes; see Target price-structure.xlsx.

Source File(s): Target price-structure.xlsx; vendor_map.xlsx; vendor_map.do; PriceTracker.do; clean_target.do; clean_defendant.do; target_price_index.do; combine_target_defendant.do; target_price_regressions_merits_rebuttal.do; target_regression_exhibits_merits_rebuttal.do; target_regression_exhibits_merits_rebuttal.xlsx

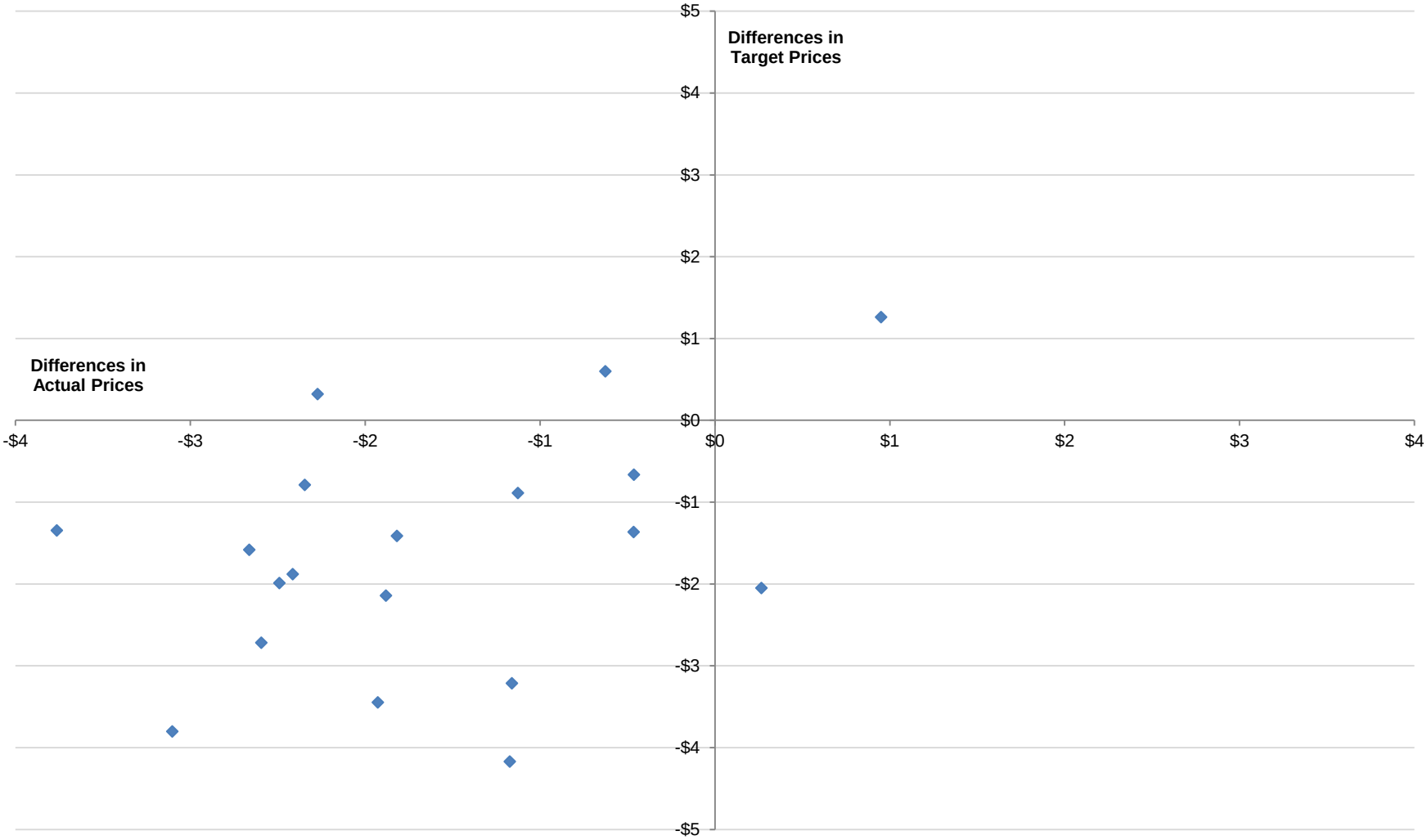
Time Series of Price Levels (Simulated Data)



Source File(s): Target_Regressions_first_differences_simulated data.do

Exhibit RR-94

Differences in Actual v. Target Prices (Simulated Data)



Source File(s): Target_Regressions_first_differences_simulated data.do

Exhibit RR-95

Target Price Regression Results - CPTs

Regression of NAFTA Actual Prices on Target Prices

By Customer, Manufacturer, Size, and Finish

Dependent variable is Ln(Actual Price)

Variable	Coefficient	Standard Error	P-Value (two-sided)
Ln(Previous Quarter's Price)	0.056	0.202	0.782
Ln(Target Price)	0.383	0.112	0.001
Ln(Price of Glass) × Size	0.011	0.005	0.029
Ln(Industrial Production)	-1.556	0.600	0.011
Unemployment Rate	-0.103	0.040	0.010
Constant	8.915	3.466	0.011

Fixed Effects by customer, manufacturer, size, and finish

Number of observations 431

R-squared 0.92

Data Source(s): Organisation for Economic Co-operation and Development, 03 January 2014, Production and Sales (MEI): Production, OECD.StatExtracts, http://stats.oecd.org/index.aspx?queryid=90#, accessed 03 January 2014.

Organisation for Economic Co-operation and Development, 03 January 2014, Key Short-Term Economic Indicators: Harmonised Unemployment Rate, OECD.StatExtracts, http://stats.oecd.org/index.aspx?queryid=21760, accessed 03 January 2014.

Bank of Korea, Undated, Glass for CRT Use.

Defendant data; see Exhibit 64 of Netz Merits Report.

Cartel meeting notes; see Target price-structure.xlsx.

Source File(s): Target price-structure.xlsx; vendor_map.xlsx; vendor_map.do; PriceTracker.do; clean_target.do; clean_defendant_NAFTA.do; target_price_index.do; combine_target_defendant_NAFTA.do; target_price_regressions_NAFTA.do; target_regression_exhibits_NAFTA.do; target_regression_exhibits_NAFTA.xlsx

Target Price Index Regression Results - CPTs

Regression of NAFTA Actual Prices on Target Price Index

By Customer, Manufacturer, Size, and Finish

Dependent variable is Ln(Actual Price)

Variable	Coefficient	Standard Error	P-Value (two-sided)
Ln(Previous Quarter's Price)	0.225	0.086	0.009
Ln(Target Price Index)	0.321	0.117	0.007
Ln(Price of Glass) × Size	0.008	0.004	0.028
Ln(Industrial Production)	-0.825	0.280	0.003
Unemployment Rate	-0.026	0.026	0.316
Constant	6.475	1.786	0.000

Fixed Effects by customer, manufacturer, size, and finish

Number of observations	1,375
R-squared	0.95

Data Source(s): Organisation for Economic Co-operation and Development, 03 January 2014, Production and Sales (MEI): Production, OECD.StatExtracts, http://stats.oecd.org/index.aspx?queryid=90#, accessed 03 January 2014.

Organisation for Economic Co-operation and Development, 03 January 2014, Key Short-Term Economic Indicators: Harmonised Unemployment Rate, OECD.StatExtracts, http://stats.oecd.org/index.aspx?queryid=21760, accessed 03 January 2014.

Bank of Korea, Undated, Glass for CRT Use.

Defendant data; see Exhibit 64 of Netz Merits Report.

Cartel meeting notes; see Target price-structure.xlsx.

Source File(s): Target price-structure.xlsx; vendor_map.xlsx; vendor_map.do; PriceTracker.do; clean_target.do; clean_defendant_NAFTA.do; target_price_index.do; combine_target_defendant_NAFTA.do; target_price_regressions_NAFTA.do; target_regression_exhibits_NAFTA.do; target_regression_exhibits_NAFTA.xlsx

Correlation Between Panasonic, MTPD Price Indices and Other Defendants' Price Indices

Defendant 1	Defendant 2	Type	Correlation	Obs.
Panasonic	Chunghwa	CPT	0.881***	23
Panasonic	Hitachi	CPT	-0.129	17
Panasonic	LG Philips	CPT	0.838***	23
Panasonic	Samsung	CPT	0.86***	23
Panasonic	Toshiba	CPT	0.202	23
MTPD	Chunghwa	CPT	0.631***	39
MTPD	LG Philips	CPT	0.615***	39
MTPD	Samsung	CPT	0.743***	39
Panasonic	Chunghwa	CDT	0.788***	28
Panasonic	Hitachi	CDT	0.945***	28
Panasonic	LG Philips	CDT	-0.244	26
Panasonic	Samsung	CDT	0.729***	23
Panasonic	Toshiba	CDT	0.937***	28

Note(s): The price indices for Panasonic and MTPD only use U.S. prices. Price indices for other defendants include worldwide prices.
*** Significant at the 1% level ($p < 0.01$)
** Significant at the 5% level ($p < 0.05$)
* Significant at the 10% level ($p < 0.10$)

Data Source(s): See Exhibit 64 of Netz Merits Report; full defendant database.dta; country codes.dta

Source File(s): Williams correlations_price indices.do; correlations_price_indices_manufacturer_type.xlsx

Alternative Overcharge Model Specifications

Application	Specification	1995Q2 - 2006Q4	2007Q1 - 2007Q4	R-squared	Adjusted R-squared
CDT	*Netz Merits Report Model*	22.0***	11.4**	0.954	0.952
	Including the Baltic Dry Index	25.0***	15.5***	0.958	0.955
	Including the IMF Fuel Index	23.2***	19.0***	0.960	0.957
	Including Korean Labor Costs	30.2***	23.4***	0.957	0.955
	Including the Korean-U.S. Exchange Rate	16.5***	6.6	0.962	0.960
	Including Desktop Shipments	28.2***	19.5***	0.961	0.959
CPT	*Netz Merits Report Model*	9.0***	3.1*	0.987	0.986
	Including the Baltic Dry Index	6.0***	0.5	0.987	0.986
	Including the IMF Fuel Index	8.2***	4.4***	0.987	0.986
	Including Korean Labor Costs	7.7***	1.1	0.987	0.986
	Including the Korean-U.S. Exchange Rate	7.6***	1.4	0.987	0.986
	Including U.S. Electronic Sales	6.3***	1.5	0.987	0.986

Note(s): * p < 0.1
** p < 0.05
*** p < 0.01

Data Source(s): us electronics.xlsx; controls.dta; estimation_size.dta

Source File(s): alternate regression data.do; alternate regression exhibit.do; alternate regression exhibit.xlsx; input_data.do

EXHIBIT 6

CERTIFIED COPY

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

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In Re: CATHODE RAY TUBE (CRT) ANTITRUST LITIGATION, Plaintiff,	Case No. 07-5944 SC MDL No. 1917
This Document Relates to: ALL ACTIONS,	

CONFIDENTIAL TRANSCRIPT ATTORNEYS' EYES ONLY

DEPOSITION OF JANET S. NETZ, PH.D.

OCTOBER 31, 2014

BALINDA DUNLAP, CSR No. 10710
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(516) 277-9494 Garden City (914) 510-9110 White Plains (312) 379-5566 Chicago (702) 366-0500 Las Vegas
+33 1 70 72 65 26 Paris +971 4 8137744 Dubai +852 3693 1522 Hong Kong

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

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In Re: CATHODE RAY TUBE (CRT) ANTITRUST LITIGATION, Plaintiff, This Document Relates to: ALL ACTIONS,	Case No. 07-5944 SC MDL No. 1917

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FRIDAY, OCTOBER 31, 2014

VIDEOTAPED DEPOSITION OF JANET S. NETZ, PH.D.

CONFIDENTIAL TRANSCRIPT ATTORNEYS' EYES ONLY

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REPORTER: BALINDA DUNLAP, CSR 10710, RPR, CRR, RMR

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speculation, object to form.

THE WITNESS: If I had observed the prices that would have held had the defendants not engaged in price-fixing, yes, it is possible that that would reveal that the overcharge was different in two different periods.

Q. BY MR. KESSLER: And in fact, you found the overcharge was different in 2007 and 2006, right?

09:36 A. That is correct.

Q. Okay. What did you do to test whether or not the overcharge in particular years might vary year by year or not?

A. Within the initial 12-year period?

09:36 Q. Yes. In other words, did you do any testing of one year versus the other to determine whether there was any variation between years, any kind of economic test, statistical test, data test, any kind of test?

09:36 A. Well, assuming that you're talking about 1995 to 2006 for CDTs, no, I did not do testing of overcharges year by year. The data are not sufficient to do such a thing.

Q. Now, in the LCD case you did do such a

09:37 test, right?

EXHIBIT 7

UNITED STATES DISTRICT COURT

FOR THE NORTHERN DISTRICT OF CALIFORNIA

OAKLAND DIVISION

IN RE: CATHODE RAY TUBE (CRT) ANTITRUST LITIGATION, THIS DOCUMENT RELATES TO: *ALL INDIRECT PURCHASER ACTIONS*	Case No. 3:07-cv-05944-JST MDL No. 1917

EXPERT REPORT OF DONALD CLARKE

March 16, 2022

1. I have been retained by defendants Irico Group Corp. and Irico Display Devices Co., Ltd. ("Irico") in the current action to provide an opinion about a pricing regulatory framework in China involving color cathode ray tubes ("CRT") and color televisions ("TV") and certain documents related thereto.

2. I am currently a Professor of Law and the David A. Weaver Research Professor at the George Washington University Law School. From 1988 through 2004, I was on the faculty of the University of Washington School of Law ("UWLS"), and I have been a visiting professor at New York University Law School, University of California at Los Angeles School of Law, and Duke Law School. From 1995 to 1998, I was on a leave of absence from UWLS and worked as an attorney at Paul, Weiss, Rifkind, Wharton & Garrison ("Paul, Weiss"), a large United States law firm with a substantial China business practice. During that period, I visited China and Hong Kong approximately twice a year in the course of my work, a substantial amount of which was related to China. From 1998 through 2003, I regularly worked with Paul, Weiss as a consultant on Chinese law matters. Since that time I have maintained an independent consulting practice.

3. I have published widely in the field of Chinese law; a full copy of my curriculum vitae including a list of publications is attached hereto as Appendix 1. I am fluent in Mandarin Chinese (speaking, reading, and writing). I am being compensated for my work at my customary hourly rate of $1,050 per hour. This compensation is in no way connected to the outcome of this litigation.

4. I graduated *cum laude* from Harvard Law School in 1987, where my studies focused on East Asian legal systems and I served as an editor of the *Harvard Law Review*. I earned a graduate degree (M.Sc. with Honours) in the Government and Politics of China from the School of Oriental and African Studies at the University of London in 1983. I also studied Chinese history for two years at Beijing University and Nanjing University in China from 1977 to 1979. I earned my undergraduate degree from Princeton University in 1977.

5. I have served as adviser or consultant on Chinese law matters to a number of bodies, including the Asian Development Bank, the Agency for International Development, and the World Bank's Financial Sector Reform and Strengthening Initiative. I have testified on aspects of the Chinese legal system before the Congressional-Executive Commission on China and the United States-China Economic and Security Review Commission. In 2005, I was appointed to the Academic Advisory Group to the US-China Working Group of the United States Congress. I was admitted to practice in the State of New York in 1988, and am a member of the Council on Foreign Relations.

6. I have been asked to provide an opinion on the following matters:

    a. Whether the following documents attached to this report (the "Pricing Documents") are genuine and authentic:[1]

[1] In order to avoid confusion, the document names in English in this list are exactly as they appear in the translations by Park IP Translations with which Irico's counsel has supplied me and which will be before the court, even if I might have translated them somewhat differently myself.

i. Notification of the State Planning Commission and the State Economic and Trade Commission regarding Issuing "Regulations on Preventing Unfair Price Actions through Dumping of Industrial Products" and Strengthening Price Self-Discipline of Industries (国家计委、国家经贸委关于发布《关于制止低价倾销工业品的不正当价格行为的规定》和加强行业价格自律的通知), issued Nov. 16, 1998, effective Nov. 25, 1998 (the "1998 Notice," attached as Appendix 2);

ii. Notification of Reporting Cost Information for Color TV and Color CRT Industry (关于报送彩电、彩管行业成本资料的通知), Feb. 3, 1999 (the "1999 Reporting Notice," attached as Appendix 3);

iii. Circular of the State Development Planning Commission on Issuing the Measures for Determining the Cost of Low-price Dumped Industrial Products (Trial) (国家计委关于印发《低价倾销工业品的成本认定办法（试行）》的通知), issued Feb. 23, 1999, effective March 1, 1999 (the "March 1999 Circular," attached as Appendix 4);

iv. Notification that the State Planning Commission and the Ministry of Information Industry print and distribute Trial Measures to Prevent Unfair Price Competition Regarding Color CRTs and Color TVs (国家计委、信息产业部印发关于制止彩色显像管、彩色电视机不正当价格竞争的试行办法的通知), issued March 15, 1999, effective April 1, 1999 (the "April 1999 Notice," attached as Appendix 5, with an additional copy attached as pages IRI-CRT-00031461 through IRI-CRT-00031464 of Appendix 6[2]);

v. Notification of Publishing Industrial Average Production Costs for Some Types of Color CRTs and Color TVs (关于发布彩色显像管、彩色电视机部分品种行业平均生产成本的通知), April 2, 1999 (the "April 1999 Cost Notification," attached as Appendix 7, with an additional copy attached as pages IRI-CRT-00031466 through IRI-CRT-00031467 of Appendix 6);

vi. Notification of Publishing Industrial Average Production Costs for Some Types of Color TVs (关于发布彩色电视机部分品种行业平均生产成本的通知), Aug. 25, 2000 (the "August 2000 Cost Notification," attached as Appendix 8);

vii. Notification of Publishing Industrial Average Production Costs for Some Types of Color CRTs (关于发布彩色显像管部分品种行业平均生产成本的通知), Sept. 13, 2000 (the "September 2000 Cost Notification," attached as Appendix 9).

[2] Appendix 6, which I understand to be produced from Irico's files, appears to be a bound copy of the April 1999 Notice and April 1999 Cost Notification, combined with various cover pages, routing slips, and a newspaper clipping.

b. The legal status of the regulatory framework constituted by the Pricing Documents.

7. My conclusions, as set forth in more detail below, are as follows:

a. Based on details below regarding the origin of some of the Pricing Documents, I believe the Pricing Documents to be genuine and authentic.

b. The regulatory framework constituted by the Pricing Documents has the status of enforceable law in the Chinese legal system.

Authenticity of the Pricing Documents

8. In order to verify the authenticity of the Pricing Documents, I independently searched available online resources, including Chinese government websites and Chinese publications. I also reviewed the documents themselves for indicia of reliability based on my knowledge of and experience with Chinese laws and regulations.

9. In terms of content and structure, the Pricing Documents are similar to many documents of a similar nature that I have seen over the course of my studies of Chinese law.

10. Unlike regulations issued by the U.S. federal government, regulatory frameworks implemented by Chinese government ministries are not always regularly published or codified in an official legal code or register. The State Council, the institution at the apex of what may loosely be analogized to China's executive branch of government, issues a publication called the State Council Gazette many times a year. The State Council Gazette publishes some (but not all) documents issued by the State Council itself, including regulations of various kinds, and some (but not all) documents issued by ministries and equivalent-level bodies under the State Council, also including regulations of various kinds. The ministries and equivalent-level bodies typically do not have this kind of regular publication. To the best of my knowledge the State Planning Commission and its successor bodies have never had such a publication.

11. An example of the unsystematic nature of publication can be seen in the fact that whereas the 1998 Notice of the State Planning Commission was, as discussed below, published in the State Council Gazette, other documents relating to the same regulatory framework issued by the State Planning Commission or its successors were not, even though they can be found on some other official government websites.

12. For the specific reasons explained below, I conclude that the Pricing Documents are genuine and authentic:

a. The 1998 Notice: I was able to independently confirm the existence of this document by finding it in the State Council Gazette.[3] It is also posted on the official website of the Development and Reform Commission of Guangdong Province in China, a regional arm of the National Development and Reform Commission,[4] which is the successor agency to the State Planning Commission

[3] STATE COUNCIL GAZETTE (国务院公报), No. 3, 1999 (Feb. 26, 1999), at 83, http://www.gov.cn/gongbao/shuju/1999/gwyb199903.pdf [https://perma.cc/H4UP-GJQH].

[4] http://drc.gd.gov.cn/gfxwj5633/content/post_861015.html [https://perma.cc/UD5E-GS8T].

that jointly issued the 1998 Notice. The content of the 1998 Notice found in the State Council Gazette and on the official website of the Development and Reform Commission of Guangdong Province appears identical to that of the notice attached as Appendix 2.

b. The 1999 Reporting Notice: I have not been able to independently procure a copy of this document on my own; the copy attached as Appendix 3 has been supplied to me by Irico's counsel. It appears to me to be genuine, based on its appearance, format, and content, which is consistent with other Chinese ministry regulations I have seen in the past. I also note that the 1999 Reporting Notice bears a seal labeled "Electronic Industry Archives" along with a copy number (2017049). I am informed by counsel that this document is a certified copy obtained from the Electronic Industry Archives maintained by the Chinese Ministry of Industry and Information Technology in Beijing, China.[5] Assuming that to be true, I believe the document to be a genuine and authentic copy of a notification issued by the Ministry of Information Industry.

c. The March 1999 Circular: I was able to independently confirm the existence of this document by finding it on the official website of the Development and Reform Commission of Guangdong Province in China.[6] The content of the March 1999 Circular found on the official website of the Development and Reform Commission of Guangdong Province appears identical to that of the notice attached as Appendix 4.

d. The April 1999 Notice: I was able to independently confirm the existence of this document by finding it on the official website of the Development and Reform Commission of Guangdong Province in China.[7] The content of the April 1999 Notice found on the official website of the Development and Reform Commission of Guangdong Province appears identical to that of the notice attached as Appendix 5, as well as the copy produced from Irico's files, bearing the Bates stamp IRI-CRT-00031457 *et seq.* and attached as Appendix 6, at pages IRI-CRT-00031461 through IRI-CRT-00031464.

e. The April 1999 Cost Notification: I was not able to find a copy of the complete text of this document independently of the copies supplied to me by Irico's counsel. The copy produced from Irico's files bearing the Bates stamp IRI-CRT-00031457 *et seq.* and attached as Appendix 6 includes at IRI-CRT-00031459 a photocopy of what purports to be a newspaper clipping reproducing the text of the April 1999 Cost Notification from page 1 of the April 13, 1999 issue of a Chinese industry newspaper called the China Electronics News (中国电子报). It was a common practice for Chinese government ministries to publish rules in national newspapers, and to do so in an industry newspaper would be quite normal. Therefore, the presence of a contemporaneous newspaper clipping tends to

[5] The Ministry of Industry and Information Technology is the successor ministry to the Ministry of Information Industry, which originally issued the 1999 Reporting Notice.

[6] http://drc.gd.gov.cn/gfxwj5633/content/post_861460.html [https://perma.cc/7GT2-XEAE].

[7] http://drc.gd.gov.cn/gfxwj5633/content/post_861921.html [https://perma.cc/KER3-PFPL].

confirm the authenticity of the April 1999 Cost Notification. What purports to be a photocopy of The April 1999 Cost Notification also appears in Irico's files at IRI-CRT-00031466 through IRI-CRT00031467. An additional copy of this document, attached as Appendix 7, bears a seal labeled "Electronic Industry Archives" along with a copy number (2017048). I am informed by counsel that this document is a certified copy obtained from the Electronic Industry Archives maintained by the Ministry of Industry and Information Technology in Beijing, China. Assuming that to be true, I believe the document to be a genuine and authentic copy of a notification issued by the Ministry of Information Industry.

f. The August 2000 Cost Notification: I have not been able to independently procure a copy of this document on my own; the copy attached as Appendix 8 has been supplied to me by Irico's counsel. It appears to me to be genuine, based on its appearance, format, and content, which is consistent with other Chinese ministry regulations I have seen in the past. I also note that the August 2000 Cost Notification bears a seal labeled "Electronic Industry Archives" along with a copy number (2017053). I am informed by counsel that this document is a certified copy obtained from the Electronic Industry Archives maintained by the Chinese Ministry of Industry and Information Technology in Beijing, China. Assuming that to be true, I believe the document to be a genuine and authentic copy of a notification issued by the Ministry of Information Industry.

g. The September 2000 Cost Notification: I have not been able to independently procure a copy of this document on my own; the copy attached as Appendix 9 has been supplied to me by Irico's counsel. It appears to me to be genuine, based on its appearance, format, and content, which is consistent with other Chinese ministry regulations I have seen in the past. I also note that the September 2000 Cost Notification bears a seal labeled "Electronic Industry Archives" along with a copy number (2017052). I am informed by counsel that this document is a certified copy obtained from the Electronic Industry Archives maintained by the Chinese Ministry of Industry and Information Technology in Beijing, China. Assuming that to be true, I believe the document to be a genuine and authentic copy of a notification issued by the Ministry of Information Industry.

Legal Status of Regulatory Framework

13. The regulatory framework set out in the Pricing Documents can be summarized as follows: Producers are required to submit information about costs to the regulator. The regulator then issues a document containing minimum prices. The producers may not price below those minima. If they do, they are subject to a variety of sanctions, ranging from warnings to fines to the loss of their business license.

14. In my opinion, as explained in more detail below, the regulatory framework set out in the Pricing Documents has the status of law in the Chinese legal system, and was binding and enforceable on producers in China.

15. China's highest legislative authorities are the National People's Congress (the "NPC") and its Standing Committee (the "NPCSC"). China's Law Against Unfair Competition, passed in 1993, prohibits pricing below cost (i.e., dumping) in order to gain competitive

advantage.[8] China's Price Law, passed in 1997 (the "Price Law"), similarly prohibits (in Article 14) "dumping commodities at prices lower than production cost in order to drive out rivals or monopolize the market[.]"[9] It further provides:

> Any operator who commits any of the acts listed in Article 14 of this Law shall be ordered to make amends and his illegal gains shall be confiscated; he may also be fined not more than five times his illegal gains; if he has no illegal gains, he shall be given a disciplinary warning and may also be fined; if the circumstances are serious, he shall be ordered to suspend business for rectification, or his business license shall be revoked by the administrative department for industry and commerce.[10]

16. The 1998 Notice contains the "Regulations on Preventing Unfair Price Actions through Dumping of Industrial Products" (the "1998 Regulations") issued jointly by the State Planning Commission and the State Economic and Trade Commission. Both these commissions are roughly equivalent to ministries under the State Council, the highest executive body in China's central government, but have a slightly higher bureaucratic rank than ordinary ministries. The State Planning Commission, which has subsequently undergone some name changes, was authoritatively described in 2009 as follows: "Most famously, the planning commission remains a powerful agency in China 30 years after the start of market reform, where it is 'first among equals' among the super-ministries."[11]

17. The State Planning Commission and other relevant departments under the State Council have authority under Articles 5, 33, and 34 of the Price Law to implement its provisions.

18. Article 5 of the 1998 Regulations sets forth a variety of "unfair price actions" in the nature of dumping (*i.e.*, selling below cost) that are specifically prohibited. Article 9 requires manufacturers to set prices at a level that reflects costs plus a reasonable profit. Article 10 states that anyone may report below-cost pricing, and that the competent government department—in this case, the State Planning Commission, which had jurisdiction over pricing—shall then investigate. Article 11 states that the producer being investigated must cooperate by supplying information. Article 12 states that when a producer is found to have committed one of the "unfair price actions" listed in Article 5, the competent government department shall order the producer to correct its actions and may in addition impose one or more of the following punishments: (1) warning, (2) fine, (3) suspension of business for a period of rectification, and (4) loss of business license (if approved by the State Administration of Industry and Commerce).

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[8] Law Against Unfair Competition (反不正当竞争法), passed by National People's Congress Standing Committee Sept. 2, 1993, effective Dec. 1, 1993, art. 11, https://perma.cc/92AU-43SW (in Chinese).

[9] Price Law (价格法), passed by National People's Congress Standing Committee Dec. 29, 1997, effective May 1, 1998, art. 14(2), https://perma.cc/Y58D-U6A5 (in Chinese).

[10] *Id.*, art. 40.

[11] Christine Wong, *Rebuilding Government for the 21st Century: Can China Incrementally Reform the Public Sector?*, 2009 CHINA QUARTERLY (no. 200) 929, 934 n.9.

19. Article 14 of the 1998 Regulations states that trade associations are directed to urge their member producers to implement the 1998 Regulations.

20. The March 1999 Circular contains the "Measures for Determining the Cost of Low-price Dumped Industrial Products (Trial)" (the "Trial Measures") issued by the State Planning Commission. The Trial Measures set forth procedures for determining production costs in order to determine whether a product is being sold for below cost (*i.e.*, dumped). Article 9(2) states that the investigation may be carried out by a government department or by a trade association, among others.

21. The April 1999 Notice contains the "Trial Measures to Prevent Unfair Price Competition Regarding Color CRTs and Color TVs" (the "Trial CRT Measures") issued jointly by the State Planning Commission and the Ministry of Information Industry (the "MII"). The Trial CRT Measures may be viewed as a specific implementation within the color CRT and color TV industry of the 1998 Regulations.

22. Article 5 of the Trial CRT Measures provides that the MII shall regularly publish average production costs of the main sizes and types of color CRTs and color TVs, and Article 6 provides that ex-factory prices shall not in principle be lower than those average production costs. The Trial CRT Measures apply by their own terms to ex-factory prices of "[a]ny business operator engaging in production and sales of color CRTs and color TVs within the People's Republic of China" (Article 2). The Trial CRT Measures also provide for the reporting, investigation, and punishment of violators.

23. The sanctions prescribed for violations of the Trial CRT Measures are all explicitly authorized by China's 1998 Law on Administrative Punishments.[12]

24. The April 1999, August 2000, and September 2000 Cost Notifications each contain charts of average CRT and/or color TV production costs that appear to have been published under the process described in Article 5 of the Trial CRT Measures, implementing the minimum prices for CRTs and color TVs contemplated under the regulatory framework.

25. The issuers and enforcers of the Pricing Documents—the State Planning Commission, the State Economic and Trade Commission, the State Administration of Industry and Commerce, and the Ministry of Information Industry—are or were at the time government departments directly under the State Council, and possessed of appropriate authority in China's legal system to create and enforce the regulatory framework set forth in the Pricing Documents.

Donald Clarke

March 16, 2022

[12] Law on Administrative Punishments (行政处罚法), passed by the National People's Congress March 17, 1996, effective Oct. 1, 1996, art. 8, https://perma.cc/7PHV-2RN3 (in Chinese).

APPENDIX 1

DONALD C. CLARKE

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CURRENT POSITION

• Professor, George Washington University Law School, Washington, DC (from Jan. 2005)

Courses taught:
- Chinese Law
- Chinese Business Law
- Business Organizations
- Law and Development

OTHER POSITIONS AND VISITORSHIPS

• Visiting Professor, Interdisciplinary Center, Herzliya, Israel (April-May 2013)
• Visiting Professor, Duke University Law School, Durham, NC (Spring 2012)
• Visiting Professor, University of California at Los Angeles School of Law, Los Angeles, CA (Fall 2008)
• Visiting Professor, New York University School of Law, New York, NY (2007-08)
• Professor, University of Washington School of Law, Seattle, Washington (1988-2004)
• Attorney, Paul Weiss Rifkind Wharton & Garrison, New York, New York (Sept. 1995-Aug. 1998) (on leave from University of Washington)
Areas of practice: Corporate, East Asia (focusing on China)
• Lecturer in Commercial Law of the Far East, Department of Law, School of Oriental and African Studies, University of London, UK (Sept. 1985-July 1988)

EDUCATION

• *Harvard Law School*, Cambridge, Mass., USA (1983-85, 1986-87)—JD cum laude 1987
Activities: Editorial Board, *Harvard Law Review*
Harvard International Law Journal
• *School of Oriental and African Studies*, University of London, UK (1981-83)—MSc 1983 in Government and Politics of China
Honors: Award of Distinction for thesis
• *Beijing University and Nanjing University*, People's Republic of China (1977-79)— Non-degree academic exchange program
Major area of study: Chinese history
• *Princeton University*, Princeton, New Jersey, USA (1973-77)—BA cum laude 1977
Major areas of study: International affairs (Woodrow Wilson School of Public and International Affairs); Certificate of Proficiency in East Asian Studies

Scholarships and Fellowships

• Law and Public Affairs Fellowship, Princeton University, 2020-21 academic year
• Rowdget Young Visiting Fellow, Faculty of Law, University of Hong Kong, June 2005
• Fulbright Research Fellowship, 2003 (Tsinghua University Faculty of Law, Beijing)
• Visiting Fellow, China Law Center, Yale Law School, Fall 2001
• Research Fellowship, National Program, Committee on Scholarly Communication with the People's Republic of China, 1991-92
• Foreign Language and Area Studies Fellowship, 1986-87 (Harvard Law School)
• Foreign Language and Area Studies Fellowship, 1984-85 (Harvard Law School)
• Commonwealth Scholarship, 1981-83 (University of London)
• Canada-China Exchange Scholarship, 1977-79 (Peking University, Nanking University)

Professional Associations and Memberships

• Member, Council on Foreign Relations
• Member, New York Bar
• Member, Executive Editorial Board, *American Journal of Comparative Law*
• Member, Editorial Board, *The China Quarterly*
• Member, Editorial Board, *Journal of Comparative Law*
• Member, Academic Advisory Group, US-China Working Group, United States Congress
• Affiliate Professor, University of Washington School of Law
• Director, Pacific Rim Law and Policy Association (publisher of *Pacific Rim Law and Policy Journal*)
• Member, Advisory Board, Center for Real Estate Law, Peking University Law School

Consultancies (selected)

• U.S. Department of Justice (2019)
• Office of the Attorney General of New Jersey (2019)
• Public Company Accounting Oversight Board (2016-2017, 2021)
• Securities and Exchange Commission (2013)
• Financial Sector Reform and Strengthening (FIRST) Initiative, *Amendments to the Securities Law of the People's Republic of China*, 2004-2005
• Asian Development Bank, *Economic Law in the People's Republic of China: Retrospect and Prospect*, 2004-2005
• Asian Development Bank, *Amendments to the Company Law of the People's Republic of China*, 2001-2005
• Agency for International Development, *Commercial Law Reform in the Former Soviet Republics*, 2002
• Asian Development Bank, *China's Legal and Administrative System*, 2001

Expert Testimony

The following is a list of cases in which I have testified at trial or in a deposition between March 15, 2018 and March 15, 2022

• Beijing Luode Property Management Co., Ltd. v. Han Qin & Fan Yang (Superior Court of California, County of Orange), Aug. 27, 2021 (deposition)

• In re Cathode Ray Tube Antitrust Litigation (U.S. Dist. Ct. for the Northern District of California, San Francisco Division), March 26, 2019 (deposition)

PUBLICATIONS

Books

China's Legal System: New Developments, New Challenges (Cambridge University Press, 2008) (edited volume)

Articles and Monographs

"Order and Law in China," *University of Illinois Law Review* (forthcoming 2022)

"Anti Anti-Orientalism, or Is Chinese Law Different?", *American Journal of Comparative Law*, vol. 68, no 1 (2020): 55-94

"Form and Function in China's Urban Land Regime: The Irrelevance of 'Ownership'," *Land Use Policy*, vol. 79 (Dec. 2018): 902-912

"The Bonding Effect in Chinese Cross-Listed Companies: Is It Real?", in Nicholas C. Howson & Robin Hui Huang (ed.), *Enforcement of Corporate and Securities Law: China and the World* (Cambridge University Press 2017): 88-100 [Working paper version: "The Bonding Effect in Cross-Listed Chinese Companies: Is It Real?", Dec. 31, 2015, GWU Legal Studies Research Paper No. 2015-55, available at http://ssrn.com/abstract=2710717]

"The Law of China's Local Government Debt: Local Government Financing Vehicles and Their Bonds" (with Fang Lu), *American Journal of Comparative Law*, vol. 65 (2017): 751-798

"Don't Ask, Don't Sell: The Criminalization of Business Intelligence in China and the Case of Peter Humphrey," *UCLA Pacific Basin Law Journal*, vol. 33, no. 2 (2016): 109-153

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LECTURES, INTERVIEWS, PRESENTATIONS, AND CONFERENCE APPEARANCES

Featured speaker, "Judging China: Illiberal Legal Systems in U.S. Courts," Council on Foreign Relations Virtual Roundtable, Jan. 13, 2022

"Judging China," paper presented at George Washington University Law School Faculty Workshop, Nov. 5, 2021

Speaker, "Judging China: Chinese Law in U.S. Courts," panel on *When Domestic Courts Evaluate Foreign Legal Systems: The Case of China*, International Law Weekend (99th Annual Meeting of the American Branch of the International Law Association), Oct. 29, 2021

Visiting lecturer, "Order and Law in China," Göttingen Summer School on Chinese Law, Max-Planck-Institut für ausländisches und internationals Privatrecht, Hamburg, Sept. 20. 2021

Speaker, "Legal Aspects of Xinjiang Detentions: Points of Argument Regarding Chinese Domestic Law," at *The Xinjiang Crisis: Genocide, Crimes Against Humanity, Justice*, Conference at Newcastle University, UK, Sept. 3, 2021

Featured speaker, "Order and Law in China," in *Rethinking Cultural Constructions of Law in East Asia* (speaker series) (University of Toronto Faculty of Law, Cornell Law School, Yale Law School), June 25, 2021

Panelist, *We Must Not Remain Silent: China's Uyghur Genocide and What You Can Do About It*, Symposium and CLE presented by The Cardozo Society, Jewish Federation of Greater Seattle, and Middle Eastern Legal Association of Washington, June 3, 2021

Commentator, *US-China Rule of Law Dialog*, sponsored by National Committee on US-China Relations, New York, NY, April 26-27, 2021

Featured speaker, "Order and Law in China," Princeton University East Asian Studies Program, March 29, 2021

Speaker, "The Xinjiang Crisis and Chinese Law," *Human Rights Symposium*, George Washington University Law School, March 25, 2021

Presenter, *Research in the Chinese Legal System*, Princeton University School of Public and International Affairs, March 16, 2021

Panelist, *International Law and the Uyghur Crisis*, Columbia Law School, March 15, 2021

Commentator, Works-in-Progress Workshop, American Society of Comparative Law, Princeton University, March 12, 2021

Featured speaker, "Judging China: How US Courts Look at the Chinese Legal System," Program in Law and Public Affairs, Princeton University, Feb. 26, 2021

Discussant, *Securities Regulatory Cooperation Over Cross-Border Listings and Transactions*, Chinese University of Hong Kong, Dec. 10-11, 2020

Moderator, *The Uyghur Human Rights Crisis: What Are the Legal Options*, George Washington University Law School, Nov. 10, 2020

Featured speaker, "Order and Law in China," Harvard Law School Comparative Law Seminar, Nov. 9, 2020

Visiting lecturer, "Anti Anti-Orientalism," Göttingen Summer School on Chinese Law, Max-Planck-Institut für ausländisches und internationals Privatrecht, Hamburg, Sept. 21. 2020

Panelist, *The Future of Hong Kong's Separate Legal System under the National Security Law*, University of London, School of Oriental & African Studies China Institute Roundtable, Sept. 9, 2020

Featured speaker, "Approaches to the Study of Chinese Law," New York University Law School, Aug. 27, 2020

Speaker, *Policy Forum: Organ Procurement and Extrajudicial Killing in China: Confronting the Evidence*, sponsored by International Coalition to End Transplant Abuse in China (ETAC), Uyghur Human Rights Project, Victims of Communism Memorial Foundation, Washington, DC, March 10, 2020

Speaker, *China's Ideological Ambitions*, workshop organized by Brookings Institution, Washington, DC, March 10, 2020

Panelist, *China and the Rule of Law: Addressing Key Human Rights Challenges Together*, workshop organized by Department of Human Rights and Labor, Department of State, Washington, DC, March 2, 2020

"China's Legal Non-Construction Project," paper presented at George Washington University Law School Faculty Workshop, Jan. 15, 2020

Panel chair, *Going Global* (seminar on business in East Asia), George Washington University, Washington, DC, Nov. 14, 2019

"China's Legal Non-Construction Project," paper presented at *China's Legal Construction Program at 40 Years—Towards an Autonomous Legal System?*, University of Michigan, Oct. 11, 2019

Presentation at *China Reform Forum*, Georgetown Law School, Washington, DC, Aug. 10, 2019

"China's Legal Non-Construction Project," keynote speech, 2019 Annual General Conference of the European China Law Studies Association, Durham University, Durham, UK, July 27, 2019

Presentation on China policy issues to Policy Planning Office, Department of State, July 11, 2019

Presentation on Chinese legal system. University of Ottawa (Certificate Program in Public Sector Leadership and Governance for federal civil servants at Director General level), Ottawa, Canada, July 5, 2019

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Panelist, *Confronting Atrocities in China: The Global Response to the Uyghur Crisis*, George Washington University, June 7, 2019

Commentator, Chinese Law Workshop, Columbia Law School, May 14, 2019

"The Chinese Legal System," presentation to China Policy Centre, Ottawa, Canada, April 16, 2019

Organizer and panelist, *Mass Detentions in Xinjiang, China: Issues of Law and Human Rights*, George Washington University Law School, April 15, 2019

"Arbitrary Detention in China," presentation at Council on Foreign Relations, Washington, DC, April 12, 2019

Panelist, *The U.S. Supreme Court Says "No" to China: Lessons Learned from the Vitamin C Case & the Implications for Cross-Border Litigation*, ABA Section on International Law Annual Conference, Washington, DC, April 11, 2019

Commentator, *Authoritarian Police and Legality in Asia*, conference at Faculty of Law, University of Hong Kong, Hong Kong, Feb. 22-23, 2019

Panel moderator, *DC Residency Lecture Series: The Chinese Dream & What It Means to the World*, Graduate School of Political Management, George Washington University, Washington, DC, July 18, 2018

"The Supreme Court's Vitamin C Antitrust Case," presentation at George Washington University Law School Faculty Workshop, Washington, DC, June 6, 2018

"The Law of Local Government Debt in China," presentation at *A Legal Revolution: Evolving Jurisprudence in Present Day China*, symposium sponsored by George Washington University International Law Review, Washington, DC, April 2018

"Corporate Governance in China," invited lecture at Columbia Law School, New York, NY, March 2018

"Local Government Debt in China," presentation at Center for Chinese Law, Columbia Law School, New York, NY, March 2018

"Anti Anti-Orientalism," paper presented at *Comparative Law Works in Progress Workshop*, sponsored by American Society of Comparative Law, Princeton, NJ, February 2018

"China's Law on Supervision," presentation at *US-China Rule of Law Dialog*, sponsored by National Committee on US-China Relations, New York, NY, November 2017

Panelist, *Containing the Fallout from the North Korea Crisis: What Role for U.S. and International Law?*, George Washington University Law School, Washington, DC, Sept. 6, 2017

Panelist, *Anti-Corruption Forever? Xi Jinping's Signature Policy in a Fraught Political Year*, Woodrow Wilson International Center for Scholars, Washington, DC, March 24, 2017

"Short- and Long-Term Perspectives on Legal Developments in China," presentation at *Fourth Annual China Law Conference*, University of Toronto Faculty of Law, Toronto, Canada, Feb. 18, 2017

Panelist, *Reinvigorating Human Rights Policy Toward China*, conference sponsored by McCain Institute for International Leadership (Arizona State University) and Robert Strauss Center for International Security and Law, Washington, DC, Nov. 15-16, 2016

"Chinese Law and Chinese Language," paper presented at conference on *How and Why Language Learning Is Useful in China Careers*, sponsored by Princeton in Beijing, Princeton, NJ, Oct. 21-23, 2016

Participant, Roundtable discussion on China's Overseas NGO Law, Department of State, Washington, DC, May 13, 2016

Panel moderator and discussant, *Judicial Reform, Legal Reform and IP in China: A Roundtable Discussion*, United States Patent and Trademark Office, Alexandria, VA, April 14, 2016

Presentation at *World Development Report 2017 on Governance and the Law, Symposium on The Role of Law in Governance*, World Bank, Washington, DC, April 13, 2016

"Anti Anti-Orientalism, or Is Chinese Law Different?", invited lecture, University of British Columbia Law School, Vancouver, Canada, March 30, 2016

"Legal and Regulatory Reform – or Not: Implications for Business," presentation at *Third Annual China Law Conference*, University of Toronto Faculty of Law, Toronto, Canada, March 26, 2016

Participant in *Sixth Sino-American Dialogue on the Rule of Law and Human Rights*, sponsored by the National Council on US-China Relations and the China Foundation for Human Rights Development, Beijing, China, Dec. 6-10, 2015

"Legal Issues of the Fourth Plenum," presentation at *5th Annual NYU Conference on Chinese Capital Markets: Assessing the Progress of China's Economic and Legal Reforms*, New York University, New York, NY, Dec. 5, 2015

Invited participant, conference on *The Chinese State & Market: Toward the 13th Five-Year Plan*, Center for Strategic and International Studies, Washington, DC, Nov. 24, 2015

"Is the Xi Administration Interested in the Rule of Law?", invited lecture at USPTO's Global IP Academy, Alexandria, VA, July 14, 2015

"Recent Developments in American Insider Trading Law: Why China Should Not Learn from the US," invited lecture, China Securities Regulatory Commission, Beijing, China, May 25, 2015

"Anti Anti-Orientalism, or Is Chinese Law Different?", invited lecture, University of Michigan Center for Chinese Studies Occasional Lecture Series, Ann Arbor, MI, March 25, 2015

"Anti Anti-Orientalism, or Is Chinese Law Different?", keynote address, *Law and the Legal Profession in China Conference*, University of Pittsburgh School of Law, Pittsburgh, PA, Feb. 27, 2015

"The Bonding Effect in Cross-Listed Chinese Companies: Is It Real?", conference paper presented at *Public and Private Enforcement of Company Law and Securities Regulation—China and the World*, sponsored by Chinese University of Hong Kong, University of Michigan Law School, and University of Michigan Center for Chinese Studies, Hong Kong, Dec. 13, 2014

"China's Stealth Urban Land Revolution," invited lecture at Fall 2014 Speaker Series, Institute for the Study of International Development, McGill University, Montreal, Canada, Nov. 27, 2014

"Fourth Plenum Legal Reforms and Their Implications for US-China Relations," talk presented at conference on *Corruption, Constitutionalism & Control: Implications of the 4th Plenum for China and U.S.-China Relations*, Woodrow Wilson International Center for Scholars, Washington, DC, Nov. 25, 2014

"Local Government Financing Vehicles in China and their Debt: The Legal Picture," talk presented at Sigur Center for Asian Studies, George Washington University, Nov. 25, 2014

"Legal Developments in China Since the Third Plenum," panel presentation at American Association for Chinese Studies Annual Meeting, Washington, DC, Oct. 11, 2014

"Blowback: How China's Efforts to Bring Private-Sector Standards into the Public Sector Backfired," paper presentation at conference on *Chinese State Capitalism and Institutional Change: Domestic and Global Implications*, Columbia Law School, New York, NY, June 13-14, 2014

"The Significance of Recent Detentions for the Rule of Law in China," testimony before the Congressional-Executive Commission on China, Washington, DC, April 8, 2014

Interviewed for the United States-China Policy Foundation's *China Forum*, available at http://youtu.be/7hfwjStUcDs, April 2, 2014

Moderator for panel on "Wider Implications of Asian Maritime Tensions," Mansfield Foundation conference on *Maritime and Territorial Disputes in East Asian Waters*, Washington, DC, Feb. 12, 2014

Speaker at Third Annual China Intellectual Property Conference, George Washington University Law School, Washington, DC, Dec. 11, 2013

"Legal Aspects of Entrepreneurship in China," presentation at US-China Legal Exchange (co-organized by U.S. Department of Commerce and P.R.C. Ministry of Commerce), George Washington University Law School, Washington, DC, Dec. 3, 2013

"China's Stealth Urban Land Revolution," seminar presentation, Yale Law School, April 4, 2013

"China's Stealth Urban Land Revolution," seminar presentation, Columbia Law School, March 1, 2013

Participant in *Fourth Sino-American Dialog on Rule of Law and Human Rights*, sponsored by the National Council on US-China Relations and the China Foundation for Human Rights Development, Haikou, China, Dec. 3-7, 2012

Discussant at *Festschrift Conference in Honor of Professor John Haley: Law in Japan and Its Role in Asia—Between East and West*, University of Washington School of Law, Seattle, Oct. 19, 2012

"China's Stealth Urban Land Revolution," invited lecture at University of Amsterdam, June 18, 2012

"China's Informal Constitutional Order," presentation at *Social Change and the Constitution: A Conference on the Occasion of the 30th Anniversary of the 1982 Constitution of the People's Republic of China*, Free University of Berlin, June 15-17, 2012

"Local Government Bonds in China: What's Behind Them?", presentation at *Shanghai Forum 2012*, sponsored by Fudan University and Korean Foundation for Advanced Studies, Shanghai, May 27, 2012 (in Chinese)

"China's Stealth Urban Land Revolution," presentation at *Perspectives on Chinese Law* conference, George Washington University Law School, Washington, DC, April 13, 2012

Panelist in "Who Makes Your iPhone? China Migration, Labor, and Human Rights," *Program in Public Law*, Duke Law School, Durham, NC, April 4, 2012

Panelist in "China's Environmental Policy," Duke Law School, Durham, NC, March 29, 2012

Interviewed by Radio Australia on recent developments in Chinese law, Mar. 21, 2012

Roundtable participant in conference on *Democracy in China and Southeast Asia: Local and National Perspectives*, Princeton University, Princeton, NJ, March 15, 2012

"China's Stealth Urban Land Revolution," Duke Law School, Durham, NC, Feb. 29, 2012

Participated in panel on "The Rule of Law and Economic Background" at conference on *Patents, Trade, and Innovation in China*, George Washington University Law School, Washington, DC, Dec. 13, 2011

Panelist at NYU Law School's *17th Annual Timothy A. Gelatt Dialogue on the Rule of Law in Asia, China's Quest for Justice: Law and Legal Institutions Since the Empire's Collapse*, Nov. 7, 2011

"Zhongguo de yinxing chengshi tudi geming" (China's Stealth Urban Land Revolution), presentation to Hongfan Institute of Law and Economics, Beijing, June 25, 2011 (in Chinese)

"Recent Developments in China's Legal System and Their Implications for Rule of Law," presentation sponsored by Economist Intelligence Unit, Shanghai, May 27, 2011

"Derivative Actions in China," invited lecture at Hong Kong University Faculty of Law, Hong Kong, May 12, 2011

Commentator, conference on *Criminal Justice in China: Comparative Perspectives*, sponsored by Chinese University of Hong Kong, Hong Kong, May 7-8, 2011

"Derivative Actions in China," presentation to faculty at Fordham University Law School, New York, March 7, 2011

"Derivative Actions in China," presentation to faculty at Duke University Law School, Durham, March 3, 2011

Discussant, *Second Sino-American Dialogue on the Rule of Law and Human Rights*, sponsored by the National Council on US-China Relations and the China Foundation for Human Rights Development, Xiamen, Dec. 7-8, 2011

"Transnational Litigation Involving China," presentation at conference on *Law and Business inChina*, sponsored by the Faculty of Law and the Asian Studies Program of Pontificia Universidad Católica de Chile, Santiago, Nov. 25-26, 2010

"Understanding the Chinese Legal System: Searching for the Right Paradigm," invited lecture at University of Buenos Aires Faculty of Law, Buenos Aires, Nov. 22,2010

"Is Chinese Law Different?", invited lecture at Universidad Torcuato Di Tella Faculty of Law, Buenos Aires, Nov. 22, 2010

"Governance and China's Evolving Relationship with Its Citizens," panel presentation at *Economist* conference *China Summit: China and the New World Disorder*, Beijing, Nov. 3, 2010

"Derivative Actions in the People's Republic of China," presentation at conference on *The Prospect of Structural Reform of the Corporate Legal System*, sponsored by Tsinghua University Faculty of Law, Beijing, Oct. 30-31, 2010

"The Interface Between the Regulation of China's Internal Market and the Global Trading System," seminar presentation, Yale Law School, Oct. 5, 2010

"The Interface Between the Regulation of China's Internal Market and the Global Trading System," seminar presentation, Columbia Law School, New York, Sept. 28, 2010

Commentator at conference on *The Global Financial Crisis and China's Development*, sponsored by the University of Chicago Center in Beijing and Renmin University School of Economics, Beijing, July 30-31, 2010

"Local Experimentation in the Chinese Legislative System," paper presented at *China-US Rule of Law Dialogue*, sponsored by the China-US Exchange Foundation, Beijing, July 29-30, 2010

"Shareholder Derivative Suits in China," invited lecture, Hong Kong University Faculty of Law, Hong Kong, June 1, 2010

Panelist on "Business Law" panel at George Washington University Law School- Georgetown University Law Center conference *Six Decades of Asian Law: A Celebration of Professor Jerome Cohen*, Washington, D.C., February 19, 2010

"Lawyers and the State in China: Recent Developments," testimony at hearing on *Human Rights and Rule of Law in China*, Congressional-Executive Commission on China, Washington, D.C., October 7, 2009

"Trends in Comparative Corporate Law Scholarship," panel presentation at Association of American Law Schools Mid-Year Conference, Long Beach, California, June 9, 2009

"Who and What Matters in Chinese Stock Markets: Implications for Regulation," presentation at symposium *A New Era Dawns for Asian Capital Markets*, Asia Law Society, University of Michigan Law School, Ann Arbor, 21 March 2009

"The Concept of the Extra-Legal in Chinese Law," presentation at Global Law Workshop, George Washington University Law School, Washington, D.C., 23 February 2009

"Is Chinese Law Different?", lecture presented at United States Naval Academy, Annapolis, Maryland, 13 February 2009

"Does Chinese Law Matter?", presentation to United States Treasury Department, Washington, D.C., 12 February 2009

"The Concept of the Extra-Legal in Chinese Law and Its Significance," lecture presented at seminar *Are Politics Really in Command? China and the Rule of Law*, Norwegian Centre for Human Rights, China Programme, Oslo, 16 January 2009

"Private Enforcement of the Public Interest in China: Potential and Pitfalls," lecture presented at UCLA Center for Chinese Studies, Los Angeles, 24 November 2008

"The Ecology of Corporate Governance in China," presentation at UCLA School of Law Faculty Colloquium, Los Angeles, 14 November 2008

"Selfishness in the Public Interest? The 'Private Attorney-General' in China," lecture presented at School of International Relations and Pacific Studies, University of California at San Diego, 30 October 2008

"New Developments in Chinese Property Law," presentation at 2008 US-China Business Law Conference at UCLA, Los Angeles, 24 October 2008

"The Ecology of Corporate Governance in China," presentation at University of Illinois Law School Faculty Workshop, Champaign, Ill., 20 October 2008

"Delaware's Dysfunctional Derivative Suit Doctrine," lecture presented at Faculty of Law, Renmin University, Beijing, 11 June 2008 (in Chinese)

"Three Concepts of the Independent Director," paper presented at Contemporary Corporate Law Scholarship Reading Group (seminar course conducted by Prof. Jeffrey Gordon, Columbia Law School), 23 April 2008

"Chinese Corporate Governance in Global Context," lecture presented at Yale University, sponsored by Yale Working Group on Corporate Governance and Millstein Center for Corporate Governance and Performance, 22 April 2008

"Corporate Governance Institutions in China," presentation at New York University School of Law Faculty Workshop, 14 April 2008

Commentator at *Conference on Law, Commerce and Development*, New York University School of Law, New York, 12 April 2008

Discussant at panel on *New Dimensions in China Watching: Internet Forums and the Study of Contemporary China*, Association for Asian Studies Annual Meeting, Atlanta, 3 April 2008

"Chinese Corporate Governance: All Sizzle, No Steak?", roundtable presentation at Council on Foreign Relations, New York, 19 November 2007

"The Institutional Environment of Chinese Corporate Governance," lecture presented at China House series on *The Legal Infrastructure of New China*, New York University, New York, 14 November 2007

"Forum Non Conveniens Issues in China-Related Litigation," presentation at *Global Justice Forum*, Columbia Law School, New York, 2 November 2007

"The Ecology of Chinese Corporate Governance," presentation at Chinese Law Workshop, Yale Law School, New Haven, 29 October 2007

"Private Attorney-General Litigation in China," paper presented at conference on *Chinese Justice*, Fairbank Center for East Asian Research, Harvard University, 12 October 2007

"The Ecology of Chinese Corporate Governance," lecture delivered at Max Planck Institute, Hamburg, Germany, 30 July 2007

Discussant at panel on *Comparative Corporate Governance: Law in Context*, Law and Society Association Annual Meeting, Berlin, 26 July 2007

"The Ecology of Chinese Corporate Governance," paper presented at panel on *Law and Development: The China Consensus?*, Law and Society Association Annual Meeting, Berlin, 26 July 2007

"China: Creating a Legal System for a Market Economy," report delivered at symposium on *Development and Reform of China's Legal and Judicial System: Review and Prospect*, sponsored by the Asian Development Bank, Beijing, 14-15 May 2007

Commentator, conference on *China's Financial System Reforms and Governance*, School of Advanced International Studies, Johns Hopkins University, Washington DC, 16 April 2007

"Is Chinese Law Different?", public lecture sponsored by East Asian Studies Program, Princeton University, Princeton, New Jersey, 10 April 2007

"The Role of Law in China's Economic Development," public lecture sponsored by Department of Economics, Middlebury College, Middlebury, Vermont, 5 April 2007

Panelist, "The Academic Perspective and Recent Research," *OECD-China Policy Dialogue on Corporate Governance*, sponsored by the OECD, Shanghai Stock Exchange, State Assets Supervision and Administration Commission, Chinese Securities Regulatory Commission, Development Research Center, Government of Japan, Global Corporate Governance Forum, and Millstein Center for Corporate Governance and Performance at Yale School of Management, 29-30 March 2007

Public lecture, "The Ecology of Chinese Corporate Governance," sponsored by Asian Institute of International Financial Law, Faculty of Law, University of Hong Kong, 2 March 2007

"The Rule of Law in China," roundtable discussion (with Jerome A. Cohen), MITRE Corporation, Washington, DC, 2 February 2007

Guest lecturer, National Taiwan University Faculty of Law, "The Institutional Environment of Corporate Governance in China" (in Chinese), 22 December 2006

Guest lecturer, New York University Law School, "Chinese Constitutional Law", 14 November 2006

"The Institutional Environment of Corporate Governance in China", lecture presented as part of Clarke Program Colloquium Series, Cornell Law School, 3 November 2006

"The Role of Non-Legal Institutions in Chinese Corporate Governance", paper presented at authors' workshop on *A Decade After Crisis: The Transformation of Corporate Governance in East Asia* sponsored by the Center of Excellence Program in Soft Law at the University of Tokyo, the Center on Financial Law at Seoul National University, and the Center for Japanese Legal Studies at Columbia Law School, Tokyo, 1 October 2006

"The Institutional Environment of Chinese Corporate Governance", paper presented at panel on *Legal Aspects of the Economic Transformation in China*, annual conference of the International Society for New Institutional Economics, Boulder, Colorado, 23 September 2006

"Law and the Economy in China: The Past Decade", paper presented at authors' workshop on *Developments in Chinese Law: The Last Ten Years*, sponsored by *The China Quarterly* and All Souls College, Oxford University, Oxford, UK, 15 September 2006

"The Institutional Environment of Corporate Governance in China and Its Policy Implications", paper presented at conference on *Corporate Governance in East Asia: Culture, Psychology, Economics and Law*, Berkeley Center for Law, Business and the Economy, Boalt Hall School of Law, 5 May 2006

Guest lecturer, Yale Law School, "Recent Revisions to China's Securities Law", 4 April 2006

Commentator, Roundtable on "China's Emerging Financial Markets: Opportunities and Obstacles," Transactional Studies Program, Columbia Law School, New York, 19 January 2006

Speaker at Timothy A. Gelatt Memorial Dialog on Law and Development in Asia, New York University Law School, New York, 18 January 2006

Speaker and participant in workshop on administrative rule-making under China's new Securities Law, sponsored by the FIRST Initiative, the Finance and Economics Committee of the National People's Congress, and the World Bank, Beijing, 14-15 January 2006

Panelist, "The Globalization of American Law? Comparative Law and the New Legal Transplants", Section on Comparative Law, American Association of Law Schools annual meeting, Washington, DC, 5 January 2006

Panelist, "Improving the Fairness and Transparency of Judicial Decisions", conference on *Rule of Law Developments in China*, sponsored by the Bureau of Democracy, Human Rights, and Labor, Department of State, Washington, DC, 7 November 2005

Interviewed on BBC World Service on recent developments in death penalty procedures in China, 26 October 2005

"Lost in Translation: Legal Transplants in Chinese Corporate Law", Rowdget Young Visiting Fellow Lecture, University of Hong Kong Faculty of Law, Hong Kong, 4 June 2005

"The Independent Director in Chinese Corporate Governance", invited paper presented at 4th Asian Corporate Governance Conference, co-hosted by Asian Institute of Corporate Governance, Korea University and Center for Financial Law, Seoul National University, sponsored by World Bank Global Corporate Governance Forum, Seoul, 19-20 May 2005

"The Legacy of History in China's Legal System", paper presented at conference on *The Rule of Law: Chinese Law and Business*, Centre for Socio-Legal Studies, Oxford University, May 11-13, 2005

"The Emerging Private Sector and China's Legal System", paper presented at conference on *China's Economic and Sociopolitical Transformation: Measuring China's Emerging Private Sector and Its Impact*, Washington, DC, 22 April 2005

"How Do We Know When an Enterprise Exists? Unanswerable Questions and Legal Polycentricity in China", paper presented at conference on *New Scholarship in Chinese Law: A Celebration in Honor of Stanley Lubman*, Center for Chinese Legal Studies, Columbia Law School, New York, 15 April 2005

"Lost in Translation? Corporate Law in China", paper presented at conference on *Asia in a Globalizing World*, Center for East Asian and Pacific Studies, University of Illinois at Urbana-Champaign, 9 April 2005

Guest lecturer in course on "China and Globalization", Prof. Reuven Avi-Yonah, University of Michigan Law School, Ann Arbor, 1 April 2005

"Law, Institutions, and Property Rights", paper presented at conference on *China's Economy: Retrospect and Prospect*, Woodrow Wilson International Center for Scholars, Washington, DC, 2 March 2005

"Insider Trading Law in the United States and China", lecture presented in Chinese at East China University of Politics and Law, Shanghai, 25 November 2004

"Law, Property Rights, and Institutions" (with Peter Murrell and Susan Whiting), paper presented at conference on *China's Economic Transition: Origins, Mechanisms, and Consequences* (Part II), University of Pittsburgh, 5-7 November 2004

"The Independent Director in Chinese Corporate Governance", opening paper presented at conference on *Amendment of the Company Law* organized by the Legislative Affairs Office of the State Council, the China Securities Regulatory Commission, and the Shanghai Stock Exchange, 10 October 2004

"Insider Trading Law in the United States and China", talk presented to Shanghai Institute of Law and Economics, Beijing, 28 September 2004

"China's Proposed Bankruptcy Law", commentator at conference on *Legal and Financial Infrastructure Requirements for Residential Mortgage Securitization in China* organized by Beijing University School of Law, Center for Real Estate Law and Financial Law Institute, Beijing, 17 July 2004

"Does Law Matter in China?", talk presented at Global Business Center, University of Washington School of Business, 15 January 2004

"Why China Should Not Adopt United States Insider Trading Law", paper presented at conference on *Corporate Fraud and Governance: American and Chinese Perspectives* organized by Shanghai Jiaotong University and New York University School of Law, Shanghai, 16 December 2003

"Human Rights and Culture", paper presented at conference on *Sino-U.S. Human Rights Conference* organized by Georgetown University Law Center, Beijing, 14 December 2003

"The History of Corporate Governance in China", commentator at conference organized by Shanghai Institute of Law and Economics, Beijing, 15 November 2003

"Professional Ethics of Defense Lawyers", commentator at conference on *The Defense Functions of Lawyers and Judicial Justice* organized by the All-China Lawyers Association, the American Bar Association, Renmin University of China, and New York University School of Law, Beijing, 21 September 2003

"The Independent Director in Chinese Corporate Governance", lecture presented at Tsinghua University Faculty of Law, Beijing, 10 April 2003

"The Independent Director in Chinese Corporate Governance", paper presented to the School of Business and Management, Hong Kong University of Science and Technology, 7 March 2003

"Assessing the Value of Law in China's Economy" (with Peter Murrell and Susan Whiting), paper presented at conference on *China's Economic Transition: Origins, Mechanisms, and Consequences* (Part I), University of Toronto, 15-17 November 2002

"China's Entry into the WTO: Prospects for Compliance", paper presented at conference on *China's Accession to the World Trade Organization*, Georgetown University Law Center, 10 Oct. 2002

"How Do We Know When an Enterprise Exists? Unanswerable Questions and Legal Polycentricity in China", paper presented at conference on *The Reform of Corporate Law Under Global Competition*, Commercial Law Research Center of the Faculty of Law, Tsinghua University, Beijing, China, 15 Sept. 2002

"Zhongguo youdai fazhan duoyuanhua de jiandu jizhi" (China Has Yet to Develop a Multidimensional Monitoring Mechanism), *21 Shiji Jingji Baodao* (21st Century Economic Report), 19 Aug. 2002, p. 39, col. 1 (interview)

Testified before the Congressional-Executive Commission on China, Washington, D.C., on issues relating to China's compliance with its WTO commitments, 6 June 2002

"Business Regulation in the Bureaucratic State: Enterprise Law in China", paper presented at panel on *The Rule of Law and Enterprise Reform in China*, Association for Asian Studies annual meeting, 5 April 2002

"What WTO Accession Does *Not* Mean for China", paper presented at panel on *WTO and the International Rule of Law*, American Society of International Law annual meeting, 15 March 2002

Testified before United States-China Security Review Commission, Washington, DC, on issues relating to China's WTO accession, 18 Jan. 2002

"The Independent Director in Chinese Corporate Governance", paper presented at conference on "Protection of Investors' Interests: International Experience and Chinese Practice", Commercial Law Research Center of the Faculty of Law, Tsinghua University, Beijing, China, 18-19 November 2001

"Economic Development and the Rights Hypothesis: The China Problem", paper presented at conference on *Law Reform in Developing and Transitional Economies*, Ulaanbaatar, Mongolia, 2-3 July 2001

Interviewed for feature entitled "Detained in China", broadcast on PBS, *The News Hour with Jim Lehrer*, 18 May 2001 <http://www.pbs.org/newshour/bb/asia/jan-june01/detained_05-18.html>

"Empirical Research in Chinese Law," paper presented to Rule of Law Workshop, Stanford Law School, 18 April 2001

"Transparency in China's Regulation of International Trade," presentation made to audiences from Chinese government, business, and academia in Beijing and Shanghai as part of 5-member United States government mission, 13-25 March 2000

"Courts and Markets in Post-Socialist Transition: China," paper presented at workshop on *Courts and Markets in Post-Socialist Transition*, University of Wisconsin School of Law, 3 March 2000

"Incentives and the Top-Down Model of Regulation in Chinese Land Law," paper presented (in Chinese) at *International Conference on the Legal Framework for Rural Land Use Rights in China*, China Institute for Reform and Development, Haikou, Hainan Province, China, 12-14 January 2000

"Corporate Governance in China," paper presented to members of Project on Corporate Governance in China, Stanford University, Stanford, California, 29 October 1999

"Alternative Approaches to Chinese Law," lecture delivered at UCLA School of Law, Los Angeles, 28 October 1999

Panelist on "Rule of Law in China – Recent Developments and Prospects," Inaugural Session of Global Business Briefing Series, Pacific Council on International Relations, Los Angeles, 28 October 1999

"Misunderstanding Chinese Law: The Lure of the 'Rule of Law' Paradigm," lecture delivered at Faculty of Law, City University of Hong Kong, 27 September1999

Guest lecturer, Chinese administrative law class of Prof. Wang Xixin, Beijing University Faculty of Law, Beijing, China, 23 September 1999

"Bankruptcy in Capitalist and Reforming Socialist Economies," brief course taught to delegation of North Korean legal officials and academics at Beijing University, Beijing, China, 20-23 September 1999

"Misunderstanding Chinese Law: The Lure of the 'Rule of Law' Paradigm," lecture delivered at Faculty of Law, Waseda University, Tokyo, Japan, 23 June 1999

"The Enforcement of Civil Judgments in China," lecture delivered at Faculty of Law, Waseda University, Tokyo, Japan, 19 June 1999

"China's Revised Criminal Law," paper presented at conference on *Contemporary Chinese Legal Development*, sponsored by Chinese Law Society of America, Harvard Law School, Cambridge, Mass., 26-27 March 1999

"Alternative Approaches to Chinese Law," lecture delivered at Yale Law School, 25 March 1999

Commentator, conference on *Administrative Law Reform in China*, sponsored by UCLA Center for Chinese Studies, International Studies & Overseas Programs, UCLA School of Law and Southern California China Colloquium, Los Angeles, 6 March 1999

Participant, *U.S.-China Symposium on the Legal Protection of Human Rights*, The Aspen Institute, 11-13 December 1998

"Private Enforcement of Intellectual Property Rights," paper presented at *Sino-U.S. Conference on Intellectual Property Rights and Economic Development: 1998 Chongqing*, sponsored by the National Bureau of Asian Research, Chongqing, China, 16-18 September 1998

Commentator, conference on *Law and Development in Asia*, co-sponsored by Asian Development Bank and Harvard University, Council on Foreign Relations, New York, 21 May 1998

"Introduction to U.S. Capital Markets for Chinese Enterprises," speech (in Chinese) presented at Investment Promotion Forum sponsored by United Nations Industrial Development Organization, Beijing, 31 March 1998

"Legal Order as a Prerequisite for Cooperation: The China Problem," paper presented at *Inaugural University of California at San Diego Social Sciences Research Conference on Cooperation Under Difficult Conditions*, Graduate School of International Relations and Pacific Studies, 18 October 1997

"Recent Developments in Criminal and Administrative Punishments in China," paper presented at University of Washington School of Law Conference on Asian Law, Seattle, Washington, 3 August 1996

"Enforcement of International Awards Involving China and Hong Kong," paper presented at EuroForum conference on *Dispute Resolution in China and Hong Kong*, London, 31 May 1996

"China and the WTO," paper presented at American Conference Institute conference on *Doing Business in China and Hong Kong*, New York, 10 May 1996

"Recent Developments in Chinese Foreign Investment Law," talk presented at conference on *Trade and Investment in Emerging Markets: China and India*, New York University School of Law, 17 November 1995

Commentator on China at *Timothy A. Gelatt Dialogue on Law and Development in Asia*, New York University School of Law, 14 September 1995

"Round Pegs and Square Holes: China and the GATT," paper presented at panel on *China in the World Economic Order* at the annual meeting of the Association for Asian Studies, Washington, DC, April 1995

"Civil Rights in China," talk delivered to Civil Rights Committee of the Seattle-King County Bar Association, Seattle, March 1995

"Foreign Business Law and China's Application to the GATT/WTO," paper presented at 1990 Institute Conference on Chinese Foreign Trade and Investment Law, San Francisco, March 1995

"China and the GATT/WTO," talk delivered to the World Affairs Club, Juneau, Alaska, March 1995

"The Chinese Court System," paper presented at *Winter Workshop on East Asian Law*, Center for Pacific Rim Studies, University of California at Los Angeles, January 1995

"Enforcement of Civil Judgments in a Changing Society: A Chinese Example," paper presented at annual meeting of the Law and Society Association, Phoenix, Arizona, 17 June 1994

"The Enforcement of Civil and Economic Judgments in China," paper presented at symposium on *The Chinese Legal System*, sponsored by the China Quarterly and the School of Oriental and African Studies, University of London, London, U.K., 10-12 May 1994

"GATT Membership for China?," paper presented at symposium on *Pacific Rim Trade*, University of Puget Sound School of Law, Washington, 5 November 1993

"The Creation of a Legal Structure for Market Institutions in China," paper presented at conference on *The Evolution of Market Institutions in Transition Economies*, Graduate School of International Relations and Pacific Studies, University of California, San Diego, 14-15 May 1993

Chair/discussant at panel on "Theoretical Perspectives in China's Legal Reform," conference on *Chinese Law -- A Re-Examination of the Field: Theoretical and Methodological Approaches to the Study of Chinese Law*, Faculty of Law, University of British Columbia, Vancouver, 22 March 1993

"Research Methodologies in Chinese Law," paper presented at conference on *Chinese Law -- A Re-Examination of the Field: Theoretical and Methodological Approaches to the Study of Chinese Law*, Faculty of Law, University of British Columbia, Vancouver, 22 March 1993

"Enforcement of Civil Judgments in China," talk delivered at *China Studies Seminar*, University of British Columbia, October 1992

Discussant at conference on *The Modernization of Chinese Law on Both Sides of the Taiwan Straits*, National Taiwan University College of Law, September 1992

"Enforcement of Civil Judgments in the People's Republic of China: Notes from the Field," talk delivered at Attorney-General's Chambers, Hong Kong, August 1992

"Dispute Resolution in China," talk delivered at Chinese University of Hong Kong, November 1991

Interviewed on modern Chinese law for program on East Asian legal systems broadcast by BBC World Service (London), September 1991

Discussant at panel on *New Perspectives on Chinese Economic Development*, Western Economic Association Annual Conference, Seattle, 30 June-3 July 1991

"The Trials of the June 4th Defendants," talk delivered at *East Asian Legal Studies Lunchtime Colloquium*, Harvard Law School, 22 March 1991

"What's Law Got to Do with It? Legal Institutions and Economic Reform in China," talk delivered at *East Asian Legal Studies Workshop*, Harvard Law School, 21 March 1991

Guest lecturer, Chinese law class of Prof. William C. Jones, Washington University School of Law, St. Louis, Missouri, 30 January 1991

"Legal Problems of Industrial Economic Reform in China," talk delivered to *Faculty Forum*, Washington University School of Law, St. Louis, Missouri, 30 January 1991

Speaker and panel chairman, "Chinese Business Law," at *China Trade Update: Doing Business with China in the 1990s*, conference sponsored by the Washington State China Relations Council, Seattle, Washington, 5 November 1990

"The Future of Democracy in China," panel discussion sponsored by the Council of International Organizations, Citizens International Center, Seattle, Washington, 21 April 1990

"Why Laws Fail: Central Legislation and the Structure of the Chinese Polity," paper delivered at *Winter Workshop on East Asian Law*, Center for Pacific Rim Studies, University of California at Los Angeles, 20 January 1990

"The Legal Background to the Behavior of State-Owned Enterprises," paper delivered at conference on *Ownership Reforms and Efficiency of State-Owned Enterprises* sponsored by the Institute of Economics of the Chinese Academy of Social Sciences and the Ford Foundation, Shenzhen, China, 6 January 1990

"Implications of Recent Events in China for Sino-U.S. Relations," panel discussion sponsored by U.S.-China People's Friendship Association and the East Asian Resource Centre, University of Washington, 11 July 1989

"Law and Economic Reform in China," *London China Seminar*, School of Oriental and African Studies, University of London, 19 May 1988

"Urban Enterprises and the Role of Law in China's Economic Reforms," Conference on *The Chinese Developmental State: Change and Continuum*, Institute of Development Studies, University of Sussex, 7-9 April 1988

Interviewed for feature entitled "How is China Run?", broadcast on BBC World Service, *The World Today*, 25 March 1988

"The 13th Congress of the Chinese Communist Party and China's Legal Reforms," Asian Studies Centre, St. Antony's College, Oxford University, 8 March 1988

"Chinese Economic and Legal Reforms," John F. Kennedy School of Government, Harvard University, 24 March 1987

Co-organizer and discussant, Conference on *China: Law and Trade 1986*, School of Oriental & African Studies, University of London, 30 June 1986

"The Role of Law in Modern China," Great Britain China Centre, London, 17 April 1986

"The Foreign Economic Contract Law," Law-China Society Seminar on China's Economic Laws, London, 17 April 1986

APPENDIX 2

EXHIBIT A

PARK
IP TRANSLATIONS
welocalize

December 20, 2017

Certification

Park IP Translations

This is to certify that the attached translation is, to the best of my knowledge and belief, a true and accurate translation from Chinese into English of: **国家计委、国家经贸委关于发布《关于制止低价倾销工业品的不正当价格行为的规定》和加强行业价格自律的通知**



Hanna Kang

Project Manager

Project Number: BBLLP_1712_051

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Notification of the State Planning Commission and the State Economic and Trade Commission regarding Issuing Regulations on Preventing Unfair Price Actions through Dumping of Industrial Products and Strengthening Price Self-Discipline of Industries

Date: November 16, 1998 Source:

Bureau of Commodity Prices (Councils) of all provinces, autonomous regions, municipalities directly under the Central Government, and municipalities with independent planning status, the State Economic and Trade Commission, the Ministry of Information Industry, the Bureau of Domestic Trade, the State Administration of Metallurgical Industry, the State Administration of Building Materials, the State Administration of Nonferrous Metal Industry, the State Administration of Petrochemical Industry, the State Administration of Machinery Industry, the State Administration of Coal Industry, the State Administration of Textile Industry, and the State Administration of Light Industry,

To prevent unfair price actions through dumping, to protect fair, open and legitimate market competition, to maintain a normal price order, and to safeguard legitimate rights and interests of business operators and consumers, the State Planning Commission and the State Economic and Trade Commission formulated the Regulations on Preventing Unfair Price Actions through Dumping of Industrial Products (hereinafter the "Regulations") pursuant to the Price Law of the People's Republic of China and related laws and regulations of the state. The Regulations are hereby promulgated, and related issues are notified as follows:

1. The Regulations are important measures taken by the state to regulate prices on the market of industrial products and important rules to prevent dumping of industrial products, which have legal effect. The promulgation and implementation of the Regulations will have an important impact on maintaining normal production and operation orders of industrial enterprises, promoting a healthy development of the entire industry, and forming a good environment of competition. All places must seriously implement the Regulations, prevent dumping according to the law, standardize the market order, and standardize price behaviors of enterprises.

2. Relevant state agencies in charge of industries may study and propose industrial average production costs pursuant to Article 8 of the Regulations and related product dumping situations, which will be published regularly to the society upon approval by the State Planning Commission to act as an alert level for price self-discipline by enterprises, to restrict pricing actions of enterprises, and to prevent dumping by enterprises. For industrial products with prices decided by the government or prices under the guidance by the government, prices stipulated by the government must still be strictly implemented.

3. Competent departments in charge of prices at all levels must strengthen monitoring and inspection on implementation of the Regulations, seriously accept and process reported cases, and investigate and punish, strictly according to laws and regulations, dumping actions. Any actions involving those under Article 5 of the Regulations shall be investigated and punished as dumping actions according to the law.

4. Industrial organizations must accept work guidance from competent government departments in charge of prices, urge and guide enterprises to seriously implement the Regulations, help competent departments in charge of the industries measure and determine industrial average costs, promptly gather and summarize industrial cost and price information, and proactively play the role of industrial organizations in preventing dumping, organizing enterprises to perform price self-discipline, and coordinating relations between enterprises.

5. All regions and all related departments must organize manufacturing enterprises and marketing enterprises to seriously study the Regulations and consciously implement the Regulations. Prices of products sold by a manufacturing enterprise shall not be lower than industrial average production costs in principle, and the sales prices of a marketing enterprise shall not be lower than its purchasing costs. All manufacturing and marketing enterprises must promptly report on actions that violate the Regulations and constitute dumping actions, proactively cooperate with competent government departments in charge of prices in price monitoring and inspection, and practically prevent dumping actions.

Any situation or issue occurred during implementation of the Regulations will be coordinated by the State Planning Commission and the State Economic and Trade Commission according their respective scope of responsibilities.

Attachment: Regulations on Preventing Unfair Price Actions through Dumping of Industrial Products

Attachment:

Regulations on Preventing Unfair Price Actions through Dumping of Industrial Products

Article 1 To prevent unfair price actions through dumping, to protect fair, open and legitimate market competition, to maintain a normal price order, to protect the national interest, and to safeguard legitimate rights and interests of business operators and consumers, the Regulations are hereby formulated pursuant to the Price Law of the People's Republic of China (hereinafter the "Price Law") and other related laws of the state.

Article 2 The Regulations are applicable to industrial products with prices subject to the market.

Article 3 Any business operator engaging in production and sales of industrial products within the People's Republic of China shall implement the Regulations.

Article 4 The unfair price actions through dumping of industrial products herein refer to actions of a business operator to expel competitors or monopolize the market, such as a production enterprise sells industrial products at prices lower than the enterprise's production costs or a marketing enterprise sells industrial products at prices lower than the enterprise's purchasing costs, which disrupt normal production and operation orders and harm the national interest or legitimate rights and interests of other business operators. A production enterprise's production cost refers to the entire cost in a current month that the enterprise produces an industrial product, including manufacturing cost and to-be-allocated management expenses, financial expenses and sales expenses; a marketing enterprise's purchasing cost includes the purchasing cost in a current month and related shipment and miscellaneous expenses when the marketing enterprise carries an industrial product.

Article 5 The following actions are unfair price actions:

(I) Ex-factory prices of industrial products sold by a manufacturing enterprise are lower than its production costs, and sales prices of a marketing enterprise are lower than its purchasing costs;

(II) Actual ex-factory prices of a manufacturing enterprise are made to be lower than its production costs, and actual sales prices of a marketing enterprise are made to be lower than its purchasing costs by means of disguised price decreases, such as using high grade and high level products as low grade and low level products;

(III) Actual ex-factory prices of a manufacturing enterprise are made to be lower than its production costs, and actual sales prices of a marketing enterprise are made to be lower than its purchasing costs by means of discounts, subsidies, and the like. Means of discounts, subsidies, and the like include: (1) direct discounts to sales prices, (2) cash discount and price discount for prices at an interest higher than bank loan interests in the same period according to time length and amount of customer prepayments, (3) different price discounts offered to customers in different sales seasons for non-seasonal products, and (4) freight subsidies in certain amount for all or a part of shipping and miscellaneous expenses of customers;

(IV) Actual ex-factory prices of a manufacturing enterprise are made to be lower than its production costs, and actual sales prices of a marketing enterprise are made to be lower than its purchasing costs by means of unequal exchanges of goods and materials;

(V) Actual ex-factory prices of a manufacturing enterprise are made to be lower than its production costs, and actual sales prices of a marketing enterprise are made to be lower than its purchasing costs by means of using goods and materials to pay back debts other than bankruptcy according to the law;

(VI) Actual ex-factory prices of a manufacturing enterprise are made to be lower than its production costs, and actual sales prices of a marketing enterprise are made to be lower than its purchasing costs by means of issuing invoices in amounts less than those of shipping goods or not issuing invoices;

(VII) Actual ex-factory prices of a manufacturing enterprise are made to be lower than its production costs, and actual sales prices of a marketing enterprise are made to be lower than its purchasing costs by means of disguised price decreases, such as providing extra quantities, bulk discounts, and the like;
(VIII) Actual ex-factory prices of a manufacturing enterprise are made to be lower than its production costs, and actual sales prices of a marketing enterprise are made to be lower than its purchasing costs by other means.
Article 6 The following two situations are not treated dumping actions:
(I) A manufacturing enterprise or a marketing enterprise lowers prices of seasonal industrial products and overstocked industrial products to below costs pursuant to Article 14, Paragraph 2 of the Price Law;
(II) Due to relatively high costs, a manufacturing enterprise or a marketing enterprise sells industrial products at prices lower than the enterprise's costs but not lower than the industrial average costs, and without harming the national interest or legitimate rights and interests of other business operators.
Article 7 When a manufacturing enterprise or a marketing enterprise lowers prices of seasonal industrial products and overstocked industrial products for sales pursuant to Article 14, Paragraph 2 of the Price Law, the prices must be clearly labelled according to the stipulated items.
Article 8 According to dumping situations in an industry, a state competent department in charge of the industry may send a proposal to the competent department of the State Council in charge of prices that industrial average costs need to be published, and as entrusted by the competent department of the State Council in charge of prices, measures, determines, and regularly publishes industrial average costs thereof.
Article 9 Manufacturing enterprises or marketing enterprises shall use costs plus reasonable profits as a goal when deciding prices of industrial products and participate in market competition with open, fair and legitimate prices. Ex-factory prices of a manufacturing enterprise shall not be lower than the industrial average production costs in principle; and sales prices of industrial products sold by a marketing enterprise shall not be lower than normal purchasing costs. Manufacturing enterprises or marketing enterprises shall decide specific prices by following the principle of pricing according quality and according to standards, specifications and levels of industrial products promulgated by the state, and prohibit sales by mixing grades or selling as gradeless goods.
Article 10 In the case where a manufacturing enterprise sells industrial products at prices lower than industrial average production costs or a marketing enterprise sells industrial products at prices lower than purchasing costs to disrupt the production and operation orders and harm rights and interests of other business operators, any organization or individual may report the case to a competent government department in charge of prices above the provincial level, and the competent government department in charge of prices may conduct investigation into the case to determine whether those are indeed dumping actions.
Article 11 A reporting party shall truthfully report a case by providing factual information regarding unfair price actions of a reported party and details of damages. A reported manufacturing enterprise or marketing enterprise shall cooperate with the competent government department in charge of prices in investigations by truthfully providing requested books, bills, vouchers and other materials.
Article 12 In the case where a reported manufacturing enterprise or marketing enterprise is found through the investigation to truly have one of the unfair price actions listed in Article 5 of the Regulations, the competent government department in charge of prices may order the manufacturing enterprise or the marketing enterprise to correct the action and impose the following punishments according to the Price Law and specific situations: (1) issue a warning; (2) impose a fine; (3) order the manufacturing enterprise or the marketing enterprise to suspend business for rectification; and (4) file a request with an administration for industry and commerce for revocation of its business license.

Article 13 A manufacturing enterprise or a marketing enterprise of industrial products shall establish and improve internal price management, and cost and expense accounting systems to truthfully and accurately record and approve production and purchasing costs of the industrial products, and no fraud will be tolerated.

Article 14 Competent departments at all levels in charge of industries and trade associations of industries shall urge operators of industrial products in respective industries to implement the Regulations. Manufacturing enterprises with sales prices lower than industrial average production costs and marketing enterprises with sales prices lower than purchasing costs may be advised for correction; in the case where an enterprise refuses to accept advice and is suspected of dumping, the enterprise may be directly reported to a competent government department in charge of prices.

Article 15 For actions of sales by decreasing prices that severely disrupt the market order and are difficult to verify individual costs thereof within a short period, the competent department of the State Council in charge of prices may determine whether those actions are dumping actions by temporarily and directly using industrial average production costs and a reasonable range of price decrease.

Article 16 The competent department of the State Council in charge of prices will work with related departments to formulate, according to the Regulations, measures to determine cost of industrial products that are dumped.

Article 17 Imported industrial products shall be subject to the Anti-Dumping and Anti-Subsidy Regulations of the People’s Republic of China.

Article 18 The Regulations shall be subjected to interpretation by the State Planning Commission.

Article 19 The Regulations shall go into effect as of November 25, 1998.

国家计委、国家经贸委关于发布《关于制止低价倾销工业品的不正当价格行为的规定》和加强行业价格自律的通知

日期：1998-11-16 来源：

各省、自治区、直辖市及计划单列市物价局（委员会）、经贸委，信息产业部、国内贸易局、国家冶金局、国家建材局、国家有色局、国家石化局、国家机械局、国家煤炭局、国家纺织局、国家轻工局：

为制止低价倾销的不正当价格竞争行为，维护公平、公开、合法的市场竞争和正常的价格秩序，保护经营者、消费者的合法权益，根据《中华人民共和国价格法》及国家有关法律、法规，国家计委、国家经贸委制定了《关于制止低价倾销工业品的不正当价格行为的规定》（以下简称《规定》），现予发布，并将有关事项通知如下：

一、《规定》是国家对工业品市场价格进行调控所采取的重要措施，是制止低价倾销工业品的重要规章，具有法律效力。《规定》的发布实施，对维持正常的工业企业生产经营秩序，促进整个工业行业的健康发展，形成良好的竞争环境将产生重要影响。各地要认真贯彻执行《规定》，依法制止低价倾销，规范市场秩序，规范企业的价格行为。

二、国家有关行业主管部门可根据《规定》第八条的有关规定和有关产品低价倾销情况，研究提出有关具体品种的行业平均成本，经国家计委同意后，定期向社会发布，作为企业价格自律的警戒线，以约束企业定价行为，防止企业低价倾销。实行政府定价、政府指导价的工业品，仍要严格按照政府规定的价格执行。

三、各级价格主管部门要加强对《规定》执行情况的监督检查，认真受理举报案件，从严查处低价倾销行为。凡涉及《规定》第五条所列行为的，均应作为低价倾销行为依法进行查处。

四、行业组织要接受政府价格主管部门的工作指导，督促、指导企业认真执行《规定》，协助行业主管部门测定行业平均成本，及时掌握、汇总行业成本、价格信息，积极发挥行业组织在制止低价倾销、组织企业进行 价格自律和协调企业之间关系等方面的作用。

五、各地区和各有关部门要组织生产企业和经销企业认真学习《规定》，自觉执行《规定》。生产企业销售的产品价格原则上不应低于行业平均生产成本，经销企业的销售价格不应低于其进货成本。各生产、经销企业对违反《规定》，构成低价倾销行为的要及时举报，并积极配合政府价格主管部门进行价格监督检查，切实制止低价倾销行为。

《规定》执行中出现的情况和问题由国家计委、国家经贸委根据各自的工作职责范围进行协调。

附：《关于制止低价倾销工业品的不正当价格行为的规定》

附：

关于制止低价倾销工业品的

不正当价格行为的规定

第一条 为制止低价倾销工业品的不正当价格行为，维护公平、公开、合法的市场竞争和正常的价格秩序，维护国家利益，保护经营者和消费者的合法权益，根据《中华人民共和国价格法》（以下简称《价格法》）及国家其他有关法律，制定本规定。

第二条 本规定适用于实行市场调节价格的工业品。

第三条 凡在中华人民共和国境内从事生产、销售工业品的经营者，均应执行本规定。

第四条 本规定所称低价倾销工业品的不正当价格行为是指经营者为了排挤竞争对手或独占市场，生产企业以低于本企业生产成本销售工业品，经销企业以低于本企业进货成本销售工业品，扰乱正常的生产经营秩序，损害国家利益或者其他经营者合法权益的行为。生产企业生产成本是指企业生产该工业品的当月完全成本，包括制造成本和应分摊的管理费用、财务费用、销售费用；经销企业进货成本包括经销企业经营该工业品时的当月进货价格和相关运杂费。

第五条 以下行为属于低价倾销不正当价格行为：

（一）生产企业销售工业品的出厂价格低于本企业生产成本的，经销企业的销售价格低于本企业进货成本的；

（二）采用高规格、高等级充抵低规格、低等级等手段，变相降低价格，使生产企业实际出厂价格低于本企业生产成本，经销企业实际销售价格低于本企业进货成本的；

（三）通过采取折扣、补贴等手段，使生产企业实际出厂价格低于本企业生产成本，经销企业实际销售价格低于本企业进货成本的。折扣、补贴等手段包括：（1）对销售价格直接折扣，（2）根据用户提前付款的时间长短和金额多少的不同，以高于银行同期贷款利率，在价格上给予现金折扣和价格折让，（3）对非季节性产品在不同销售季节对用户给予不同价格折让，（4）对用户全部或部分承担运杂费或给予一定数量的运费补贴；

（四）进行非对等物资串换，使生产企业实际出厂价格低于本企业生产成本，经销企业实际销售价格低于本企业进货成本的；

（五）除依法实行破产外，通过以物抵债，使生产企业实际出厂价格低于本企业生产成本，经销企业实际销售价格低于本企业进货成本的；

（六）采取多发货少开票或不开票方式经销，使生产企业实际出厂价格低于本企业生

产成本，经销企业实际销售价格低于本企业进货成本的；

（七）通过多给数量、批量优惠等方式，变相降低价格，使生产企业实际出厂价格低于本企业生产成本，经销企业实际销售价格低于本企业进货成本的；

（八）采用其他方式使生产企业实际出厂价格低于本企业生产成本，经销企业实际销售价格低于本企业进货成本的。

第六条 以下两种情况不视为低价倾销行为：

（一）生产企业或经销企业依据《价格法》第十四条第二款规定，以低于成本的价格降价处理季节性、积压性工业品的；

（二）生产企业或经销企业由于成本较高，以低于本企业成本但不低于行业平均成本的价格销售，未对国家利益或者其他经营者利益造成损害的。

第七条 生产企业或经销企业依据《价格法》第十四条第二款规定，对季节性工业品、积压工业品降价出售时，必须按规范的项目明码标价。

第八条 国家工业行业主管部门可根据本行业产品低价倾销情况，向国务院价格主管部门提出需发布行业平均成本的工业品品种建议，并接受国务院价格主管部门的委托，测定和定期发布其行业平均生产成本。

第九条 生产企业或经销企业制定工业品价格应以成本加合理利润为目标，以公开、公正、合法的价格参与市场竞争。生产企业的工业品出厂价格原则上不应低于行业平均生产成本；经销企业的工业品销售价格不应低于正常进货成本。生产企业或经销企业应当遵循按质论价原则，按照国家颁布的工业品标准和规格、等级制定具体价格，禁止混等和按统货出售。

第十条 生产企业以低于行业平均生产成本或经销企业以低于进货成本销售工业品，造成生产经营秩序混乱，并损害了其他经营者权益，任何单位和个人都可以向省级以上政府价格主管部门举报，政府价格主管部门可以根据情况立案调查，以确定是否属低价倾销行为。

第十一条 举报人应据实反映情况，提供被举报人不正当价格行为的事实材料及被损害情况。被举报的生产企业或经销企业应当配合政府价格主管部门调查，如实提供所需的帐薄、单据、凭证以及其它资料。

第十二条 经调查认定，被举报的生产企业或经销企业确有本规定第五条所列不正当价格行为之一的，政府价格主管部门可以责令其改正，并视具体情况依据《价格法》进行下列处罚：（1）予以警告；（2）处以罚款；（3）责令其停业整顿；（4）提请工商行政

管理

机构吊销其营业执照。

第十三条 工业品生产企业或经销企业应当建立、健全内部价格管理及成本、费用核算制度，据实、准确记录与核定工业品的生产成本及进货成本，不得弄虚作假。

第十四条 各级工业行业主管部门、工业行业协会要督促本行业工业品经营者执行本规定。对生产企业低于行业平均生产成本销售的、经销企业低于正常进货成本销售的，可以规劝其改正；对于不接受规劝，有低价倾销嫌疑的，可以向政府价格主管部门直接举报。

第十五条 国务院价格主管部门对严重扰乱市场秩序，短期内难以核实其个别成本的降价销售行为，可临时采取直接依据行业平均成本和合理的下浮幅度的办法认定其是否为低价倾销行为。

第十六条 国务院价格主管部门将会同有关部门依据本规定制定低价倾销工业品的成本认定办法。

第十七条 进口工业品适用《中华人民共和国反倾销和反补贴条例》。

第十八条 本规定由国家计委负责解释。

第十九条 本规定自1998年11月25日起执行。

APPENDIX 3

EXHIBIT D

December 20, 2017

Certification

Park IP Translations

This is to certify that the attached translation is, to the best of my knowledge and belief, a true and accurate translation from Chinese into English of: **关于报送彩电、彩管行业成本资料的通知**



Hanna Kang

Project Manager

Project Number: BBLLP_1712_051

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P 1

Document of the Ministry of Information Industry
Xin Bu Yun [1999] No. 121

Notification of Reporting Cost Information for Color TV and Color CRT Industry

To all relevant enterprises:

To prevent actions of unfair price competition through dumping in the color TV and color CRT industry, to protect fair, open and legitimate market competition, to maintain a normal price order, and to safeguard legitimate rights and interests of business operators and consumers, this Ministry plans to estimate and publish average industry production costs of some types of color TVs and color CRTs through consultation with and upon approval by the State Planning Commission pursuant to instructions by leaders of the State Council and the Regulations on Preventing Unfair Price Actions through Dumping of Industrial Products Ji Jia Ge (1998) No. 2332 by the State Planning Commission and the State Economic and Trade Commission. To successfully complete this task, this Ministry hereby sends you a notification of related requirements as follows:

1. Enterprises on the list (see Attached Table 1) shall fill in the attached Tables 2 and 3 with their respective production and cost information of 21” and 25” color TVs or color CRTs in the 4th quarter of 1998, and report the information by February 10, 1999. Information for each subsequent quarter shall be reported within 10 days after said each quarter. Each enterprise shall designate a specific person to be in charge of this task and periodically report relevant information. This Ministry will rigorously keep confidentiality of the information reported by enterprises to prevent leakage of business secrets of the enterprises.

Electronic Industry Archives	
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2. On the basis of production and cost information reported by the enterprises, this Ministry will estimate and publish average industry production costs of some of color TVs and color CRTs. For enterprises with sales prices lower than the average industry production costs, this Ministry will work with the State Planning Commission and other departments to perform investigations pursuant to the Regulations on Preventing Unfair Price Actions through Dumping of Industrial Products. Enterprises found through the investigation to truly have actions of unfair price competition through dumping will be punished.

3. The Department of Economic System Reform and Economic Operations of this Ministry is in charge of this task of estimation and publication of average industry production costs for the color TV and color CRT industry.

Telephone: 010-68208341, 68208342.
Fax: 010-68277286
Contacts: Fusuo Bao, Tingru Liu
Address: No. 27 Wanshou Road, Beijing
Zip code: 100846
This Notification shall go into effect as of the date of issuance.

Attachments: 1. List of enterprises to report production and cost information of color TVs or color CRTs
2. Table of quarterly production and cost information of color TVs
3. Table of quarterly production and cost information of color CRTs

Keywords:
Cc
Information

(No text on this page)

February 3, 1999
(Seal of the Ministry of Information Industry of the People's Republic of China)

Keywords: color TV, color CRT, cost, notification

Cc: The State Planning Commission and the State Economic and Trade Commission.

The General Office of the Ministry of Information Industry

Printed and distributed on February 3, 1999

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Attachment 1

List of enterprises to report production and cost information of color TVs or color CRTs

1. Sichuan Changhong Electronic Group Co., Ltd.
2. Konka Group Co., Ltd.
3. TCL Group Co., Ltd.
4. Shenzhen Chuangwei-RGB Electronics Co., Ltd.
5. Qingdao Hisense Group Co., Ltd.
6. Xiamen Overseas Chinese Electronic Co., Ltd.
7. Panda Electronics Group Co., Ltd.
8. Shanghai Guangdian (Group) Co., Ltd.
9. Beijing Peony Electronic Group Co., Ltd.
10. Guangdong Gaoluhua TV Co., Ltd.
11. Caihong Group Corporation
12. Beijing Matsushita Color CRT Co., Ltd.
13. Shanghai Novel Color Picture Tube Co., Ltd.
14. Huafei Color Display Systems Co., Ltd.
15. Shenzhen SEG Hitachi Display Component Co., Ltd.
16. Guangdong Color Picture Tube Co., Ltd.
17. Lejin Shuguang Electronic Co., Ltd.
18. Shenzhen Samsung Electronic Tube Co., Ltd.

Attachment 2 Table of quarterly production and cost information of color TVs

Attachment 2

Table of quarterly production and cost information of color TVs

Filled by (company seal affixed) Unit: Yuan

	Size	Production quantity (unit)	Sales quantity (unit)	Unit cost					Ex-factory price			Inventory at end of quarter (unit)
				Manufacturing cost	Financial expenses	Sales expenses	Management expenses	Total cost	Sales tax and surtaxes	Average ex-factory price	Lowest ex-factory price	
Verified number for the previous quarter	21”											
	25”											
Predicted number for the current quarter	21”											
	25”											

Filled by: Telephone: Filled on:

Instructions: if there are different models for the same size, the model with a lower cost shall be filled in the table.

Attachment 3

Table of quarterly production and cost information of color CRTs

Filled by (company seal affixed) Unit: Yuan

	Size	Production quantity (piece)	Sales quantity (piece)	Unit cost					Ex-factory price			Inventory at end of quarter (piece)
				Manufacturing cost	Financial expenses	Sales expenses	Management expenses	Total cost	Sales tax and surtaxes	Average ex-factory price	Lowest ex-factory price	
Verified number for the previous quarter	21”											
	25”											
Predicted number for the current quarter	21”											
	25”											

Filled by: Telephone: Filled on:

Instructions: if there are different models for the same size, the model with a lower cost shall be filled in the table.

档99之 2 2

信息产业部文件

信部运〔1999〕121号

关于报送彩电、彩管行业成本资料的通知

各有关企业：

为制止彩电、彩管行业低价倾销的不正当价格行为，维护公平、公开、合法的市场竞争和正常的价格秩序，保护经营者、消费者的合法权益，根据国务院领导的批示和国家计委、国家经贸委计价格(1998)2332号《关于制止低价倾销工业品的不正当价格行为的规定》，经商国家计委同意，我部拟对彩电、彩管部分品种测定和发布其行业平均生产成本。为做好这项工作，现将有关要求通知如下：

1、列入名单的企业(见附表一)要在99年2月10日前，将本企业21英寸、25英寸彩电或彩管98年四季度的产量、成本资料按附表二、三的内容填报后上报。以后每季度后10日内及时

电子工业档案馆
复印 2017049 号

上报。各企业要设专人负责此项工作，并定期上报有关资料。我部将对企业上报资料严格保密，以避免企业商业机密的泄漏。

2、在企业上报产量、成本资料的基础上，我部将测算出部分彩电、彩管的行业平均生产成本，并予以公布。对低于行业平均生产成本销售的企业，我部将配合国家计委等部门，按照《关于制止低价倾销工业品的不正当价格行为的规定》进行调查。对经调查认定确有低价倾销不正当价格行为的企业，将进行处罚。

3、我部经济体制改革与经济运行司负责彩电、彩管行业平均生产成本的测算与发布工作。

联系电话：010—68208341、68208342。

传真：010—68277286

联系人：暴福锁　刘廷儒

地址：北京万寿路27号

邮编：100846

本通知自下发之日起执行。

附件：一、上报彩电、彩管成本、价格资料的企业名单

二、彩电季度成本、价格资料表

三、彩管季度成本、价格资料表

资 密 部 业 照 调 将 业

（此页无正文）

中华人民共和国信息产业部

一九九九年二月三日

主题词：彩电 彩管 成本 通知

抄 送：国家计委，国家经贸委。

信息产业部办公厅 一九九九年二月三日印发

附件一

上报彩电、彩管成本、价格资料企业名单

1、四川长虹电子集团公司
2、康佳集团股份有限公司
3、TCL集团有限公司
4、深圳创维—RGB电子有限公司
5、青岛海信集团公司
6、厦门华侨电子企业有限公司
7、熊猫电子集团股份有限公司
8、上海广电(集团)有限公司
9、北京牡丹电子集团公司
10、广东高路华电视机有限公司
11、彩虹集团公司
12、北京松下彩管有限公司
13、上海永新彩色显象管有限公司
14、华飞彩色显示系统有限公司
15、深圳赛格日立显示器件有限公司
16、广东彩色显象管有限公司
17、乐金曙光电子有限公司
18、深圳三星电管有限公司

彩色电视机季度成本、价格资料表

附件二

彩色电视机季度成本、价格资料表

填报单位(加盖公章)：　　单位：元

	规格	生产数量（台）	销售数量（台）	单位成本					出厂价格			季末库存（台）
				制造成本	财务费用	销售费用	管理费用	完全成本	销售税金及附加	平均出厂价	最低出厂价	
上季核定	21英寸											
	25英寸											
本季预测	21英寸											
	25英寸											

填报人：　　联系电话：　　填报时间：

填表说明：同一规格中如有不同型号，按成本低的型号填写。

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附件三

彩色显象管季度成本、价格资料表

填报单位(加盖公章)：　　单位:元

	规格	生产数量（只）	销售数量（只）	单位成本					出厂价格			季末库存（只）
				制造成本	财务费用	销售费用	管理费用	完全成本	销售税金及附加	平均出厂价	最低出厂价	
上季核定	21英寸											
	25英寸											
本季预测	21英寸											
	25英寸											

填报人：　　联系电话：　　填报时间：

填表说明：同一规格中如有不同型号，按成本低的型号填写。

APPENDIX 4

February 14, 2022

Certification

Park IP Translations

TRANSLATOR'S DECLARATION:

I, Samuel Chong, hereby declare:

That I possess advanced knowledge of the Chinese and English languages. The attached Chinese into English translation has been translated by me and to the best of my knowledge and belief, it is a true and accurate translation of:
国家计委关于印发《低价倾销工业品的成本认定办法（试行）》的通知（1999年3月1日起执行）

Samuel Chong

Project Number: BBLLP_2202_P0002

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Circular of the State Development Planning Commission on Issuing the Measures for Determining the Cost of Low-price Dumped Industrial Products (Trial)

Issued on February 23, 1999; Effective on March 1, 1999 Effective

Basic information

Document No: JJG[1999]177

Level of validity

Validity: Currently effective

Date of publication: February 23, 1999

Date of implementation: March 1, 1999

Published by the State Development Planning Commission

Text

Price bureaus (commissions) of provinces, autonomous regions, municipalities directly under the central government and municipalities with independent planning status, the Ministry of Information Industry, the State Administration of Internal Trade, the State Administration of Metallurgical Industry, the State Administration of Construction Materials Industry, the State Administration of Machinery Industry, the State Administration of Chemical Industry, the State Administration of Nonferrous Metals Industry, the State Administration of Coal Industry, and the State Administration of Textile Industry:

In order to prevent low-price dumping of industrial products, we have drafted the Measures for Determining the Cost of Low-price Dumped Industrial Products (Trial) according to the Provisions on Stopping Unfair Price Behaviors of Dumping Industrial Products at Low Prices, which were jointly published by the State Development Planning Commission and the State Economic and Trade Commission. The Measures have been issued, and you shall implement them and report to the State Development Planning Commission when you find any problems in the implementation process.

Measures for Determining the Cost of Low-price Dumped Industrial Products (Trial)

Article 1 The Measures are drafted in order to stop unfair price behaviors of dumping industrial products at low prices, and in accordance with the Provisions on Stopping Unfair Price Behaviors of Dumping Industrial Products at Low Prices, as well as other financial & accounting laws, regulations, and systems.

Article 2 The Measures are applicable to industrial products with average costs estimated and released in accordance with the Provisions on Stopping Unfair Price Behaviors of Dumping Industrial Products at Low Prices.

Article 3 When an enterprise sells industrial product at price lower than the average cost released by industry regulators, and it’s reported by other enterprises and individuals, the government’s price authorities should look into the case and determine the product’s cost according to the measures.

Article 4 The cost of industrial products mentioned in the Measures refers to the unit cost incurred in the production and sales of such industrial products. The cost of a manufacturing enterprise includes manufacturing cost, expenses (administrative expenses, sales expenses and financial expenses) that should

be reasonably apportioned, as well as sales tax and surcharges incurred for the sale of the product. The cost of a distribution enterprise includes the unit purchase price of the industrial product, the unit freight and miscellaneous expenses that should be apportioned and tax that should be paid.

Article 5 The State Council and provincial price authorities determine the cost of low-price dumped industrial products.

Article 6 Cost of low-price dumped industrial products shall be determined according to the following principles:

1. Cost shall be determined according to relevant provisions in the *Accounting Law of the People's Republic of China, the Accounting Standards for Business Enterprises, the General Rules for Enterprise Finance*, and industry financial accounting systems.

2. Cost shall be determined in line with the basic and general principles of accounting and according to the actual cost. When production expenses are accumulated and allocated, direct expenses are directly included in cost accounting, indirect expenses are apportioned in cost accounting according to the specified standard or a certain proportion. Once an enterprise's cost calculation and apportionment method is determined, it shall not be changed arbitrarily. After the cost allocation standard of indirect expenses is determined, it shall not be changed within one accounting year.

3. When determining the cost, the depreciation cost difference generated within a range specified by the state is generally recognized. However, the cost difference caused by the following circumstances shall not be recognized and shall be added at the time of cost determination:

(1) Cost difference caused by the enterprise's depreciation rate that is lower than the minimum depreciation rate specified by the state;

(2) Cost difference caused by special preferential policies enjoyed by the enterprise;

(3) Cost difference caused by expenses that have not been accrued and amortized because the enterprise does not carry out accounting practices on the accrual basis;

(4) Cost difference caused by the enterprise adopting inappropriate measures to reduce cost.

4. When determining the cost, a production enterprise shall take the cost of the previous month as the accounting basis, and if necessary, cost in the past can also be taken into account; a distribution enterprise shall take the actual cost of the current batch of products as the accounting basis.

Article 7 The unit full cost of a production enterprise shall be calculated according to the following provisions:

1. Manufacturing cost is based on the accurate, true and reliable data of the corresponding products and specifications in the enterprise's cost report.

2. Period cost allocation. Firstly, calculate the ratio of the current period expenses (deducting sales expenses of specific products) to the total manufacturing cost (or total manufacturing hours) of all completed products as the apportionment coefficient. Secondly, the apportionment coefficient is multiplied by the unit manufacturing cost (or unit manufacturing hours) of the corresponding products and specifications to determine the period cost to be apportioned for the product. The formula is shown below:

(1) A product's unit period expense to be apportioned = the product's unit manufacturing cost (or unit manufacturing hours) × apportionment coefficient

(2) Apportionment coefficient = Total period expenses (deducting sales expenses for specific products) ÷ total manufacturing cost (or total manufacturing hours) of all completed products

3. Apportionment of sales tax and surcharges. Firstly, check the sales tax, surcharges and sales revenue in the income statement, figure out the proportion of sales tax and surcharges in the sales revenue and take it as the apportionment coefficient. Secondly, the apportionment coefficient is multiplied by the sales price of the corresponding products and specifications, to calculate the unit sales tax and surcharges to be apportioned. The formula is shown below:

(1) A product's sales tax and surcharges to be apportioned = the product's unit price × apportioned coefficient

(2) Apportionment coefficient = Sales tax and surcharges for all products sold in a period ÷ total sales revenue for all products sold in the period

Article 8 The cost of a distribution enterprise shall be calculated according to the sum of the purchase price, the freight cost and miscellaneous expenses and tax payable. The formula is shown below:

1. A merchandise's unit cost = unit purchase price + unit freight cost to be apportioned + unit tax payable

2. Unit freight cost to be apportioned = unit purchase price × apportionment coefficient

3. Apportionment coefficient = Total freight expenses in a purchase ÷ total purchase price

Article 9 Cost of low-price dumped industrial products shall be determined according to the following procedures:

1. The competent price department of the government shall file a case against suspected low-cost dumping reported by relevant units and individuals due to market disorder caused by selling at a price lower than the average cost of the industry.

2. After a case is filed, if cost investigation is necessary, the government's price department can conduct cost investigation, or commission the industry regulator, industry association or an intermediary to do the job. Investigators (No less than two persons) shall determine the enterprise's cost according to the Accounting Law of the People's Republic of China, the Accounting Standards for Business Enterprises, the General Rules for Enterprise Finance, and industry financial accounting systems, as well as authentic and reliable data provided by the enterprise, and issue a cost determination report.

3. Based on a review of the cost determination report, the government's price department shall determine whether the enterprise has dumped products at unreasonably low prices, and impose fines according to the law if dumping practices are substantiated.

Article 10 If the information provided by the investigated enterprise is incomplete, making it difficult to determine the cost, or to verify the cost in the short term, but the enterprise's price reduction has obviously had a significant impact on the market order and the national economy and seriously damaged the interests of other business operators, which must be stopped in time, the price department under the State Council may temporarily determine whether it is a low-cost dumping by adopting the average cost of the industry and a reasonable downward floating range. The downward floating range shall be determined by the price department of the State Council in conjunction with the industry department according to market conditions and the advanced production level of the industry.

Article 11 The Measures will be revised and explained by the State Development Planning Commission.

Article 12 The Measures will be implemented from March 1, 1999.

国家计委关于印发《低价倾销工业品的成本认定办法（试行）》的通知

颁布时间：1999-02-23　实施日期：1999-03-01　有效

基本信息

发文字号　计价格[1999]177号
效力级别
时效性　现行有效
颁布日期　1999-02-23
实施日期　1999-03-01
发布机关　国家发展计划委员会

正文

各省、自治区、直辖市及计划单列市物价局（委员会）、信息产业部，国家内贸局、国家冶金局、国家建材局、国家机械局、国家化工局、国家有色局、国家煤炭局、国家纺织局：

为制止低价倾销工业品的不正当价格行为，根据国家计委、国家经贸委颁布的《关于制止低价倾销工业品的不正当价格行为的规定》，我们制定了《低价倾销工业品的成本认定办法（试行）》，现印发给你们，请认真贯彻执行。执行中出现的问题，请及时向国家计委反映。

低价倾销工业品的成本认定办法（试行）

第一条　为制止低价倾销工业品的不正当价格行为，根据《关于制止低价倾销工业品的不正当价格行为的规定》和国家有关财务会计法律、法规及制度，制定本办法。

第二条　本办法适用于依据《关于制止低价倾销工业品的不正当价格行为的规定》测定发布行业平均成本的工业品。

第三条　当企业以低于国家有关行业主管部门发布的行业平均成本的价格销售工业品，受到有关单位和个人举报时，政府价格主管部门应及时立案调查并依据本办法组织进行该工业品成本认定。

第四条　本办法所称工业品成本是指企业生产、销售该工业品发生的相关单位成本费用。生产企业的成本包括制造成本和应合理分摊的期间费用（管理费用、销售费用和财务费用）以及为销售该产品而发生的销售税金和附加。经销企业的成本包括该工业品单位进价和应分摊的单位运杂费以及应纳价内税。

第五条　国务院和省级政府价格主管部门是低价倾销工业品的成本认定机构。

湖北女子4年7次诉讼
国办发文严厉打击代孕
小偷尾随老人偷8000
农家乐老板种1438株
男子因病厌世街头持
工伤鉴定是自己还是单
工伤鉴定书单位没有给
工伤鉴定书被单位拿走
女企业家实名举报索贿

热门标签
婚姻继承　知识产权
程序法　合同债权
劳动　公司法
房地产　医疗保险

咸阳推荐律师
白鹏君律师
177-3062-1777

第六条　低价倾销工业品的成本认定应遵循以下原则：

一、成本认定按照《中华人民共和国会计法》、《企业会计准则》、《企业财务通则》和行业财务会计制度的规定进行。

二、成本认定遵循会计核算的基本原则和一般原则，按照实际成本认定。生产费用归集和分配时，直接费用直接计入成本核算对象，间接费用按规定的标准或一定的比例分摊计入成本核算对象。企业成本计算及分摊方法一经确定，不得随意变更。间接费用的分配标准确定后，一个会计年度内不得变动。

三、成本认定时，一般承认在国家规定的折旧提取范围内产生的折旧成本差异。但以下情况造成的成本差异不予承认，应在成本认定时追加：

（一）企业折旧率低于国家规定的低限折旧率造成的成本差异；

（二）企业因享受特殊优惠政策造成的成本差异；

（三）企业未按权责发生制进行核算，期间费用应提未提、应摊未摊造成的成本差异；

（四）企业采取不正当手段降低成本造成的成本差异。

四、成本认定时，生产企业按上月成本为确认依据，必要时可根据情况考核企业以前的成本；经销企业按当批商品的实际发生成本为确认依据。

第七条　生产企业单位完全成本按以下规定核算：

一、制造成本以企业成本报表中对应品种、规格的准确、真实、可靠的数据为依据。

二、期间费用分配。首先计算出当期期间费用（扣除特定产品销售费用）与全部完工产品总制造成本（或总制造工时）的比率，作为分摊系数。其次，用分摊系数分别乘对应品种、规格的单位制造成本（或单位制造工时），确定该产品应分摊的期间费用。计算公式如下：

（一）该产品应分摊的单位期间费用＝该产品单位制造成本（单位制造工时）×分摊系数

（二）分摊系数＝当期全部期间费用（扣除特定产

品销售费用）÷当期全部完工产品总制造成本（总制造工时）

三、销售税金及附加的分配。首先根据损益表中的销售税金及附加和销售收入，计算出销售税金及附加占销售收入的比例，作为分摊系数。其次，用分摊系数乘以对应品种、规格的销售价格，作为应分摊的单位销售税金及附加。具体计算公式如下：

（一）该产品应分摊的产品销售税金及附加＝该产品单位售价×分摊系数

（二）分摊系数＝当期全部产品销售税金及附加÷当期全部产品销售收入之和

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第八条　经销企业成本按进货价格与相应发生的运杂费及应纳价内税之和计算。具体计算公式如下：

一、某商品单位成本＝该商品单位进价＋该商品应分摊的单位运杂费＋该商品应纳价内税

二、该商品应分摊的运杂费＝该商品单位进价×分摊系数

三、分摊系数＝本次采购发生的全部运杂费÷本次采购全部商品进价之和

第九条　低价倾销工业品的成本按以下程序认定：

一、政府价格主管部门对以低于发布行业平均成本的价格销售，造成市场秩序混乱，受到有关单位和个人举报的涉嫌低价倾销行为要及时立案。

二、涉嫌低价倾销案件立案后，需要进行成本调查的，政府价格主管部门可直接进行成本调查，也可委托有关行业主管部门或行业协会组织、中介机构进行成本调查。调查人员（不得少于2人）应按照《中华人民共和国会计法》、《企业会计准则》、《企业财务通则》及行业财务会计制度和企业真实、可靠数据，认定企业成本。在核实确认的基础上，出具成本认定报告。

三、政府价格主管部门在审核成本认定报告基础上，做出被调查企业是否低价倾销的判定，确属低价倾销行为的，依法进行处罚。

第十条　如被调查企业提供资料不全，使成本认定难以进行，或短期内难以核定其成本，但企业的降价行为已明显对市场秩序和国民经济造成重大影响，严重损害了其他经营者利益，必须及时制止时，国务院价格主管部门可临时采取直接依据行业平均成本和合理下浮幅度的办法认定其是否为低价倾销行为。行业平均成本下浮幅度由国务院价格主管部门会同行业主管部门根据市场状况、行业先进生产水平等情况确定。

第十一条　本办法由国家计委负责修订和解释。

第十二条　本办法自1999年3月1日起施行。

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APPENDIX 5

EXHIBIT B

December 20, 2017

Certification

Park IP Translations

This is to certify that the attached translation is, to the best of my knowledge and belief, a true and accurate translation from Chinese into English of: **国家计委、信息产业部印发关于制止彩色显像管、彩色电视机不正当价格竞争试行办法的通知**

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Project Manager

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Notification that the State Planning Commission and the Ministry of Information Industry print and distribute Trial Measures to Prevent Unfair Price Competition Regarding Color CRTs and Color TVs

Date of distribution: June 27, 2008 Number of browses: 4 Font: [large medium small] Share

Bureau of Commodity Prices (Councils) and Competent Departments in Charge of the Electronic Industry of all provinces, autonomous regions, municipalities directly under the Central Government, and municipalities with independent planning status:

To prevent actions of unfair price competition through dumping in the color TV and color CRT industry and to maintain a normal market competition order, the State Planning Commission and the Ministry of Information Industry formulated the Trial Measures to Prevent Unfair Price Competition Regarding Color CRTs and Color TVs (hereinafter the “Measures”), which is hereby printed and distributed to you. You are asked to seriously implement the Measures. Related issues are hereby notified as follows:

1. Prices of color TVs have fallen sharply over recently years due to the oversupply of products and increasingly fierce market competition. In the price cutting competition, some color TV and color CRT manufacturing enterprises sell the products at prices lower than production costs, which disrupts normal price order and harm legitimate rights and interests of other business operators and consumers. The competent departments in charge of price and electronics in all places must work with related departments in planning, economic and trade, strengthen leadership, and work closely to implement the Measures.

2. According to the spirit of instructions of leading comrades of the State Council, the State Planning Commission and the Ministry of Information Industry have decided to treat color TVs and color CRTs as key products for Preventing dumping and regulating the market order according to the law in 1999. All places must strengthen monitoring and inspection, and the main content of inspection includes: whether ex-factory prices of color CRT and color TV manufacturing enterprises are lower than their production costs, and whether the sales prices of marketing enterprises are lower than their purchasing costs; whether sales are made at low prices by means of discounts, subsidies, and offering extra quantities; whether sales are made at low prices by means of using raw materials and parts and components imported through smuggling, lowering performance indexes, using shoddy products as good products, reporting false costs, etc.

3. All color CRT and color TV manufacturing enterprises must strictly comply with all provisions in the Measures, consciously regulate pricing actions, truthfully and accurately record and verify

production costs and purchasing costs, strictly prohibit allocating less expenses and falsely reporting costs. At the same time, the enterprises must check and correct, on their own, any action of unfair price competition and actively report actions of unfair price competition to competent departments in charge of prices.

4. Please promptly report any problem occurred in the process of implementing the Measures, monitoring and inspection in all places to the State Planning Commission and the Ministry of Information Industry.

Attachment: Attachment of Trial Measures to Prevent Unfair Price Competition Regarding Color CRTs and Color TVs

Trial Measures to Prevent Unfair Price Competition Regarding Color CRTs and Color TVs

Article 1 To prevent actions of unfair price competition in the color TV and color CRT industry, to protect fair, open and legitimate market competition, to maintain a normal price order, to protect the national interest, and to safeguard legitimate rights and interests of business operators and consumers, the Measures are hereby formulated according to the Price Law of the People's Republic of China (hereinafter the "Price Law") and other related laws of the state.

Article 2 Any business operator engaging in production and sales of color CRTs and color TVs within the People's Republic of China shall implement the Measures.

Article 3 The actions of unfair price competition herein refer to actions of a business operator to sell products at prices lower than the enterprise's cost or sell products at low prices by reducing costs using unfair means, so as to expel competitors or monopolize the market, which disrupt normal production and operation orders and harm the national interest or legitimate rights and interests of other business operators.

Article 4 The following actions of color CRT and color TV operators are actions of unfair price competition:

(I) Ex-factory prices of a manufacturing enterprise are lower than its production costs in the same period, and sales prices of a marketing enterprise are lower than its purchasing costs in the same period;

(II) Actual ex-factory prices of a manufacturing enterprise are made to be lower than its production costs, and actual sales prices of a marketing enterprise are made to be lower than its purchasing costs by means of discounts, subsidies, and offering extra quantities;

(III) Sales are made at low prices by means of using raw materials and parts and components imported through smuggling, lowering performance indexes, using shoddy products as good products, reporting false costs, etc.;

(IV) A color CRT buyer with relatively great advantages in market shares uses its advantageous position to force a color CRT manufacturing enterprise to sell products at prices lower than its production costs;

(V) Actual ex-factory prices of a manufacturing enterprise are made to be lower than its production costs in the same period, or actual sales prices of a marketing enterprise are made to be lower than its purchasing costs in the same period by using other means.

Article 5 The Ministry of Information Industry regularly publishes industrial average production costs of main types and sizes of color CRTs and color TVs. The State Planning Commission and the Ministry of Information Industry determine and publish a reasonable amplitude of price decrease.

Article 6 Ex-factory prices of a manufacturing enterprise shall not be lower than the industrial average production costs in principle; and the sales prices of a marketing enterprise shall not be lower than normal purchasing costs.

Article 7 In the case where a manufacturing enterprise sells products at prices below published industrial average production costs, or a marketing enterprise sells products at prices below its purchasing costs in the same period, leading to market price disorder and harms to interests of other manufacturing enterprises or marketing enterprises, the harmed manufacturing enterprises or marketing enterprises may report the issue to the State Planning Commission or a competent department in charge of prices of a province, autonomous region or municipality directly under the Central Government; and the competent government department in charge of prices shall perform investigation into the case according to the situation.

Article 8 A reporting party shall truthfully report a case by providing factual information regarding actions of unfair price competition of a reported party and details of damages. A reported business operator shall cooperate with a competent government department in charge of prices in investigations by truthfully providing related books, bills, vouchers and other materials.

Article 9 In the case where a reported operator of color CRTs and color TVs is found through the investigation to truly have actions of unfair price competition listed in Article 4 of the Measures, the competent government department in charge of prices shall order the operator to correct the action and impose the following punishments according to the Price Law and specific situations:

(I) Issue a warning;

(II) Impose a fine;

(III) Order the operator to suspend business for rectification;

(IV) File a request with an administration for industry and commerce for revocation of its business license.

Article 10 When performing inspections, a competent department in charge of prices should first use individual costs of producers or operators as a main determination basis. When it is difficult to confirm an individual cost, industrial average production costs and a reasonable amplitude of price decrease are used as main determination bases.

Article 11 An operator of color CRTs and color TVs shall establish and improve internal price management, and cost and expense accounting systems to truthfully and accurately record and approve production and purchasing costs, and no fraud will be tolerated.

Article 12 Competent departments at all levels in charge of the electronic industry and the color CRT and color TV trade association shall urge operators of color CRTs and color TVs to implement the Measures. For manufacturing enterprises and marketing enterprises that violate the Measures, they shall be advised to correct; in case where the advice is invalid, and a report may be filed with a competent department in charge of prices for official investigations.

Article 13 The Measures shall be subjected to interpretation by the State Planning Commission.

Article 14 The Measures shall go into effect as of April 1, 1999.

国家计委、信息产业部印发关于制止彩色显像管、彩色电视机不正当价格竞争的试行办法的通知

发布日期：2008-06-27 浏览次数：4 字体：[大 中 小] 分享

各省、自治区、直辖市及计划单列市物价局（委员会），电子工业主管部门：

为了制止彩色显像管、彩色电视机行业的不正当价格竞争行为，维护正常的市场竞争秩序，国家计委、信息产业部制定了《关于制止彩色显像管、彩色电视机不正当价格竞争的试行办法》（以下简称《办法》），现

印发给你们，请认真贯彻执行，并就有关事项通知如下：

一、近几年来，由于产品供过于求，市场竞争日趋激烈，彩色电视机价格大幅度下降。在降价竞争中，一些彩色电视机、彩色显像管生产企业以低于生产成本的价格进行销售，扰乱了正常的价格秩序，损害了其他经

营者和消费者的合法权益。各地价格、电子主管部门要会同计划、经贸等有关部门，加强领导，密切配合，共同做好《办法》的贯彻实施工作。

二、遵照国务院领导同志的指示精神，国家计委、信息产业部决定，将彩色显像管和彩色电视机作为1999年制止低价倾销、依法规范市场秩序的重点品种。各地要加强监督检查，检查的主要内容是：彩色显像管、彩色电视机生产企业的出厂价格是否低于其生产成本，经销企业的销售价格是否低于其进货成本；是否采取折扣、补贴、多给数量等手段低价销售；是否采取使用走私进口原材料和零配件、降低性能指标、以次充好、虚报成本等手段低价销售。

三、彩色显像管和彩色电视机生产企业要严格执行《办法》的各项规定，自

觉规范价格行为，据实、准确记录与核定生产成本及进货成本，严禁少摊费用，虚置成本。同时要对有无不正当价格竞争行为进行自查自纠，并积极向价格主管部门举报不正当价格竞争行为。

四、各地在贯彻实施《办法》和监督检查过程中存在的问题，请及时报告国家计委和信息产业部。

附件：关于制止彩色显像管、彩色电视机不正当价格竞争的试行办法附件

关于制止彩色显像管、彩色电视机不正当价格竞争的试行办法

第一条　为制止彩色显像管、彩色电视机行业的不正当价格竞争行为，维护公平、公开、合法的市场竞争和正常的价格秩序，维护国家利益，保护经营者和消费者的合法权益，根据《中华人民共和国价格法》（以下简称《价格法》）及国家其他有关法律，制定本办法。

第二条　凡在中华人民共和国境内从事生产、销售彩色显像管、彩色电视机的经营者，均应执行本办法。

第三条 本办法所称的不正当价格竞争行为是指，经营者为了排挤竞争对手或独占市场，以低于本企业成本销售，或者采取其它不正当手段降低成本低价销售，扰乱正常的生产经营秩序，损害国家利益或其它经营者合法权益的行为。

第四条 彩色显像管、彩色电视机经营者的下列行为属于不正当价格竞争行

为：

（一）生产企业的出厂价格低于其同一时期生产成本，经销企业的销售价格低于其同一时期进货成本；

（二）采取折扣、补贴、多给数量等方式，使生产企业的实际出厂价格低于本企业生产成本，经销企业实际销售价格低于本企业进货成本；

（三）使用走私进口原材料和零配件、降低性能标准、以次充好、虚报成本等手段低价销售；

（四）市场份额占较大优势的彩色显像管购买者利用其优势地位迫使彩色显像管生产企业低于其生产成本销售产品；

（五）采取其它方式，使生产企业的实际出厂价格低于其同一时期生产成本，或经销企业的实际销售价格低于其同一时期进货成本。

第五条 信息产业部定期发布彩色显像管、彩色电视机主要品种、规格的行业平均生产成本。国家计委会同信息产业部确定和公布合理的下浮幅度。

第六条 生产企业的出厂价格原则上不应低于行业平均生产成本；经销企业的销售价格不应低于正常进货成本。

第七条 生产企业以低于发布的行业平均生产成本销售，经销企业以低于其同期进货成本销售，造成市场价格秩序混乱、损害其它生产企业和经销企业利益的，受损害的生产企业和经销企业可向国家计委或者省、
自治区、直辖市政府价格主管部门举报；政府价格主管部门根据情况立案调查。

第八条 举报人应当据实反映情况，提供被举报人不正当价格竞争行为的事实材料和被损害的情况。被举报的经营者，应当配合政府价格主管部门调查，如实提供相关的帐薄、单据、凭证以及其它资料。

第九条 经调查认定，被举报的彩色显像管、彩色电视机经营者确有本办法第四条所列不正当价格竞争行为的，由政府价格主管部门责令改正，并视具体情况依据《价格法》进行下列处罚：

（一）予以警告；

（二）处以罚款；

（三）责令其停业整顿；

（四）提请工商行政管理机关吊销其营业执照。

第十条 价格主管部门实施检查时，首先应以生产、经营者的个别成本为主要判定依据。当个别成本难以认定时，以行业平均成本和合理的下浮幅度为主要判定依据。

第十一条 彩色显像管、彩色电视机经营者应当建立、健全内部价格管理及成本、费用核算制度，据实、准确记录与核定生产成本及进货成本，不得弄虚作假。

第十二条 各级电子工业主管部门及彩色显像管、彩色电视机行业协会应当督促彩色显像管、彩色电视机经营者执行本办法。对生产企业和经销企业违反本办法的，规劝其改正；规劝无效的，可向政府价格主管部门举报，要求立案调查。

第十三条 本办法由国家计委负责解释。

第十四条 本办法自 1999 年 4 月 1 日起施行。

APPENDIX 6

January 10, 2022

Certification

Welocalize Translations

TRANSLATOR'S DECLARATION:

I, Johnson Wong, hereby declare:

That I possess advanced knowledge of the Chinese and English languages. The attached Chinese into English translation has been translated by me and to the best of my knowledge and belief, it is a true and accurate translation of: IRI-CRT-00031457

Johnson Wong

Project Number: BBLLP_2201_P0001

P. JOHNSON, PhD
1-11-22
EXHIBIT
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IRICO Group Corporation		
C06 Enterprise Management		
Notice on Trial Measures to Curb Unfair Price Competition Regarding Color CRTs and Color TVs and Notice on Publishing Industrial Average Production Costs of Some Types of Color CRTs and Color TVs		
From March 1999 to April 1999	Retention period	Long term
There are ten pages in this volume	Filing No.	

Whole volume No.	Catalog No.	Docket No.

In-Volume Catalog

S.N.	Document author	Original document No.	Document receipt No.	Confidentiality level	Document date	Title	No. of Page
1	Ministry of Information Industry	Ji Jia Ge (99) 264	46		March 15, 1999	Notice of the State Planning Commission and the Ministry of Information Industry on Distributing Trial Measures to Curb Unfair Price Competition Regarding Color CRTs and Color TVs	1-7
2	Id.	Xin Yun Bu (99) 287	51		April 2, 1999	Notice on Publishing Industrial Average Production Costs of Some Types of Color CRTs and Color TVs	8-10

Mr. Wu: please review this document. April 15, 1999
001

Official document	Receipt No. 46 April 14, 1999

From the first page of China Electronics Daily, April 13, 1999

Notice on Publishing Industrial Average Production Costs of Some Types of Color CRTs and Color TVs
Xin Bu Yun [1999] No. 287

To curb unfair price competition in the color CRT and color TV industry and maintain normal market order, we have estimated the industrial average production costs of two types of color CRTs and color TVs, i.e. 21-inch and 25-inch, pursuant to the Trial Measures to Curb Unfair Price Competition Regarding Color CRTs and Color TVs by the State Planning Commission and the Ministry of Information Industry, the cost materials submitted by major manufacturers of color CRTs and color TVs, and the results of survey on typical enterprises. The estimation is hereby published (see the attached table). All color CRT and color TV manufacturers are asked to conscientiously implement the estimation. In case where a manufacturer sells its products at the prices lower than the published industrial average production costs, causing market disorders and harming the interests of other manufacturers, a harmed enterprise may file a report with the State Planning Commission or a competent department in charge of prices of a province, autonomous region and municipality directly under the Central Government. If it is found through investigation that, such manufacturer indeed engages in unfair price competition, a competent government department in charge of prices shall order such manufacturer to correct and impose penalties on it in light of the specific circumstance.

This Notice will be implemented from the date of publication.

Attached Table: Industrial Average Production Costs of Some Sizes and Types of Color CRTs and Color TVs

21” Color CRT	RMB440/piece	21” Color TV	RMB1,130/set
25” Color CRT	RMB720 /piece	25” Color TV	RMB1,700/set

Ministry of Information Industry, April 2, 1999

IRICO Group Corporation Document Review List

Group’s proposed opinion: Mr. Wu: please review this document. April 15, 1999	Department’s proposed opinion:

Leader’s instructions:

Circulation time	Signature	Circulation time	Signature	Circulation time	Signature	Circulation time	Signature

Required completion time	Processing result Fax sent April 15, 1999 Signature from the leader of the handling organization

Mr. Wu: please review this document. April 15, 1999
001

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Ministry of Information Industry, April 2, 1999

Notice on Trial Measures to Curb Unfair Price Competition Regarding Color CRTs and Color TVs

Bureaus (Commissions) of Commodity Prices and Competent Departments in Charge of the Electronic Industry of provinces, autonomous regions, municipalities directly under the Central Government, and municipalities specifically designated in the state plan:

To curb unfair price competition and maintain normal market competition order, the State Planning Commission and the Ministry of Information Industry have formulated the Trial Measures to Curb Unfair Price Competition Regarding Color CRTs and Color TVs (hereinafter referred to as the “Measures”), which are hereby distributed for your earnest implementation. Related issues are hereby notified as follows:

Mr. Wu: please review this document. April 15, 1999
001

Official document	Receipt No. 46 April 14, 1999

National Development Planning Commission
Ministry of Information Industry

Document

Ji Jia Ge [1999] No. 264

Notice of the State Planning Commission and the Ministry of Information Industry on Distributing Trial Measures to Curb Unfair Price Competition Regarding Color CRTs and Color TVs

Bureaus (Commissions) of Commodity Prices and Competent Departments in Charge of the Electronic Industry of provinces, autonomous regions, municipalities directly under the Central Government, and municipalities specifically designated in the state plan:

To curb unfair price competition and maintain normal market competition order, the State Planning Commission and the Ministry of Information Industry have formulated the Trial Measures to Curb Unfair Price Competition Regarding Color CRTs and Color TVs (hereinafter referred to as the "Measures"), which are hereby distributed for your earnest implementation. Related issues are hereby notified as follows:

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1. Prices of color TVs have plunged in recent years due to the oversupply of products and increasingly fierce market competition. In the price cut competition, some color TV and color CRT manufacturers sell their products at the prices lower than production costs, which disrupts normal price order and harm legitimate rights and interests of other business operators and consumers. The competent departments in charge of price and electronics in all places must work closely with related departments in planning, economic and trade to strengthen leadership and ensure the sound implementation of the Measures.

2. According to the principles of instructions from the leading comrades of the State Council, the State Planning Commission and the Ministry of Information Industry have decided to focus on color TVs and color CRTs during the campaign of preventing dumping and regulating the market order according to the law in 1999. All places must step up supervision and inspection, with the focus on: whether ex-factory prices of color CRT and color TV manufacturers are lower than their production costs, and whether the sales prices of distributors are lower than their purchasing costs; whether sales are made at low prices by means of discount, subsidy and extra quantity; whether sales are made at low prices by means of using raw materials and parts and components imported through smuggling, lowering performance indicators, using shoddy products as good products, falsely reporting costs, etc.

3. All color CRT and color TV manufacturers must strictly comply with all provisions in the Measures, consciously regulate pricing, truthfully and accurately record and verify production and purchasing costs, and strictly prohibit less amortization and false reporting of costs. At the same time, the enterprises must correct the unfair price competition found in self-inspection and actively report the unfair price competition to competent departments in charge of prices.

4. All places should promptly report any problem arising in the implementation of the Measures, supervision and inspection to the State Planning Commission and the Ministry of Information Industry.

Attachment: Trial Measures to Curb Unfair Price Competition Regarding Color CRTs and Color TVs

(Seal of the National Development Planning Commission of the People's Republic of China)

National Development Planning Commission

March 15, 1999

(Seal of the Ministry of Information Industry of the People's Republic of China)

Ministry of Information Industry

Keywords: color TV, price measures, Notice

Cc: The General Office of the State Council, the State Economic and Trade Commission, the Ministry of Finance, the General Administration of Customs, and the Planning Commissions (Planning and Economic Commissions) of all provinces, autonomous regions, municipalities directly under the Central Government and cities specifically designated in the state plan

004

Attachment:

Trial Measures to Curb Unfair Price Competition Regarding Color CRTs and Color TVs

Article 1 To curb unfair price competition in the color TV and color CRT industry, protect fair, open and legitimate market competition, the national interest and the legitimate rights and interests of business operators and consumers, and maintain normal price order, the Measures are hereby formulated according to the Price Law of the People's Republic of China (hereinafter referred to as the "Price Law") and other applicable laws of the state.

Article 2 Any business operator engaging in production and sales of color CRTs and color TVs within the People's Republic of China shall implement the Measures.

Article 3 The unfair price competition herein refers to misconduct of a business operator to sell products at the prices lower than their cost or sell products at low prices by reducing costs using unfair means, so as to expel competitors or monopolize the market, which disrupts normal production and operation orders and harms the national interest or legitimate rights and interests of other business operators.

Article 4 The following misconducts of color CRT and color TV operators constitute unfair price competition:

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(I) Ex-factory prices of a manufacturer are lower than its production costs over the same period, and sales prices of a distributor are lower than its purchasing costs over the same period;

(II) Actual ex-factory prices of a manufacturer are made lower than its production costs, and actual sales prices of a distributor are made lower than its purchasing costs by means of discount, subsidy and extra quantity;

(III) Sales are made at low prices by means of using raw materials and parts and components imported through smuggling, lowering performance indicators, using shoddy products as good products, falsely reporting costs, etc.;

(IV) A color CRT buyer takes advantage its big market share to force a color CRT manufacturer to sell products at the prices lower than its production costs;

(V) Actual ex-factory prices of a manufacturer are lower than its production costs over the same period, or actual sales prices of a distributor are lower than its purchasing costs over the same period by other means.

Article 5 The Ministry of Information Industry regularly publishes industrial average production costs of main types and sizes of color CRTs and color TVs. The State Planning Commission and the Ministry of Information Industry determine and publish a reasonable range of price decrease.

Article 6 Ex-factory prices of a manufacturer shall not be lower than the industrial average production costs in principle; and the sales prices of a distributor shall not be lower than normal purchasing costs.

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Article 7 In case where a manufacturer sells its products at the prices lower than published industrial average production costs, or a distributor sells its products at the prices lower than its purchasing costs over the same period, leading to market price disorder and harms to the interests of other manufacturers or distributors, the harmed manufacturers or distributors may report the same to the State Planning Commission or a competent department in charge of prices of a province, autonomous region or municipality directly under the Central Government; and the competent government department in charge of prices will launch investigation into the case in light of the circumstance.

Article 8 The reporting party shall truthfully report the case by providing factual information regarding unfair price competition of the reported party and details of damages. A reported business operator shall cooperate with a competent government department in charge of prices in the investigation by truthfully providing related books, bills, vouchers and other materials.

Article 9 If it is found through the investigation that, the reported operator of color CRTs and color TVs is indeed committing unfair price competition set forth in Article 4 of the Measures, the competent government department in charge of prices shall order the operator to make correction and impose the following penalties according to the Price Law and specific circumstances:

(I) Issue a warning;

(II) Impose a fine;

(III) Order the operator to suspend business for rectification; and

(IV) File a request with an administration for industry and commerce for revocation of its business license.

007

Article 10 When performing inspection, a competent department in charge of prices should first take individual costs of manufacturers or operators as a main basis. When it is difficult to confirm an individual cost, industrial average production costs and a reasonable range of price decrease will be used as the main bases.

Article 11 An operator of color CRTs and color TVs shall establish and improve internal price management, cost and expense accounting systems to truthfully and accurately record and verify production and purchasing costs, with no false statement.

Article 12 Competent departments at all levels in the electronic industry and the color CRT and color TV trade association shall urge operators of color CRTs and color TVs to implement the Measures. For manufacturers and distributors that violate the Measures, they shall be advised to correct; in case where the advice doesn't work, a report may be submitted to a competent department in charge of prices for official investigation.

Article 13 The Measures shall be interpreted by the State Planning Commission.

Article 14 The Measures shall go into effect as of April 1, 1999.

Official document	Receipt No. 51 April 21, 1999

Document of the Ministry of Information Industry

Xin Bu Yun [1999] No. 287

Notice on Publishing Industrial Average Production Costs of Some Types of Color CRTs and Color TVs

IRICO Group Corporation Document Review List

Group's proposed opinion:	Department's proposed opinion:

Leader's instructions:

Circulation time	Signature	Circulation time	Signature	Circulation time	Signature	Circulation time	Signature

Required completion time	Processing result Signature from the leader of the handling organization

Official document	Receipt No. 51 April 21, 1999

Document of the Ministry of Information Industry

Xin Bu Yun [1999] No. 287

Notice on Publishing Industrial Average Production Costs of Some Types of Color CRTs and Color TVs

Color CRT and Color TV manufacturers:

To curb unfair price competition in the color CRT and color TV industry and maintain normal market order, we have estimated the industrial average production costs of two types of color CRTs and color TVs, i.e. 21 inches and 25 inches, pursuant to the Trial Measures to Curb Unfair Price Competition Regarding Color CRTs and Color TVs by the State Planning Commission and the Ministry of Information Industry, the cost materials submitted by major manufacturers of color CRTs and color TVs, and the results of investigation into typical enterprises. The estimation is hereby published (see the attached table). All color CRT and color TV manufacturers are asked to conscientiously implement the estimation. In case where a manufacturer sells its products at the prices lower than the published industrial average production costs, causing market disorders and harming the interests of other manufacturers, a harmed enterprise may file a report with the State Planning Commission or a competent department in charge of prices of a province,

CONFIDENTIAL

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autonomous region or municipality directly under the Central Government. If it is found through investigation that, such manufacturer indeed engages in unfair price competition, a competent government department in charge of prices shall order such manufacturer to correct and impose penalties on it in light of specific circumstances.

This Notice shall go into effect as of the date of distribution.

Attachment: Table

April 2, 1999

(Seal of the Ministry of Information Industry of the People's Republic of China)

Keywords: color CRT, color TV, cost, Notice

Cc: The State Planning Commission, the State Economic and Trade Commission, and the State Administration for Industry and Commerce.

The General Office of the Ministry of Information Industry Distributed on April 12, 1999

-2-

010

Table:

Industrial Average Production costs for Some Sizes and Types of Color CRTs and Color TVs

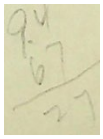
21" Color CRT	RMB440/piece
25" Color CRT	RMB720/piece
21" Color TV	RMB1,130/set
25" Color TV	RMB 1,700/set

-3-

Note

Whole volume No.:	
Catalog No.:	
Docket No.:	
There are a total of 10 pages within this volume (or book)	
Defects or other situations of this volume (or book)	
Volume prepared by: Wang Yueqin	Checked by:
August 15, 2000	Date:

03513 x 824



彩虹集团公司

C06 企业管理

关于制止彩色显像管、彩色电视机不正当价格竞争的试行办法及发布彩管、彩电部分品种行业平均生产成本的通知

自九九年 三 月至九九年 四 月	保管期限	长 期
本卷内共 十 张	归 档 号	

全宗号	目录号	案卷号

卷 内 目 录

顺序号	文件作者	文件原编字号	文件收文编号	秘别	文件日期	标题	文件所在张号
1	信息产业部	计价格(99)264	46		99.3.15	国家计委、信息产业部印发关于制止彩色显像管、彩色电视机不正当价格竞争的试行办法的通知	1~7
2	〃	信函部(99)287	51		99.4.2	关于发布彩色显像管、彩色电视机部分品种行业平均生产成本的通知	8~10

001

请总经理阅示 15/4-99

公文 收 46 号 99年4月14日

摘自中国电子报1999年4月13日第一版.

关于发布彩色显像管、彩色电视机分品种行业平均生产成本的通知

信部运〔1999〕287号

制止彩色显像管、彩色电视机行业的不正当价格竞维护正常的市场秩序，根据国家计委、信息产业部止彩色显像管、彩色电视机不正当价格竞争的试行我部依据各主要彩管、彩电生产企业报送的成本资典型企业的调研情况，对21英寸、25英寸两个品管、彩电的行业平均生产成本进行了测算，现予发表）。请各彩管、彩电生产企业认真贯彻执行。生低于发布的行业平均生产成本销售，造成市场秩序害其他生产企业利益的，受损害的企业可向国家计委、或者省、自治区、直辖市价格主管部门举报。对经调查认定，确有不正当价格竞争行为的由政府价格主管部门责令改正，并视具体情况进行处罚。

本通知自发布之日起执行。

附表：部分规格品种彩管、彩电行业平均生产成本

21英寸彩管	440元/只	21英寸彩电	1130元/只
25英寸彩管	720元/只	25英寸彩电	1700元/只

信息产业部 1999年4月2日

彩虹电子集团公司文件阅办单

集团拟办意见：请总经理阅示 15/4-99

部拟办意见：

领导指示：

传阅时间	签字	传阅时间	签字	传阅时间	签字	传阅时间	签字

求完成时间 | 处理结果

传真已发 99年4月15日

承办单位领导签字

001

公文 收 46 号 99年4月14日

摘自中国电子报1999年4月13日第一版.

于发布彩色显像管、彩色电视机分品种行业平均生产成本的通知

信部运〔1999〕287号

制止彩色显像管、彩色电视机行业的不正当价格竞维护正常的市场秩序，根据国家计委、信息产业部止彩色显像管、彩色电视机不正当价格竞争的试行我部依据各主要彩管、彩电生产企业报送的成本资典型企业的调研情况，对21英寸、25英寸两个品管、彩电的行业平均生产成本进行了测算，现予发表）。请各彩管、彩电生产企业认真贯彻执行。生低于发布的行业平均生产成本销售，造成市场秩序害其他生产企业利益的，受损害的企业可向国家计委、或者省、自治区、直辖市价格主管部门举报。对经调查认定，确有不正当价格竞争行为的由政府价格主管部门责令改正，并视具体情况进行处罚。

本通知自发布之日起执行。

附表：部分规格品种彩管、彩电行业平均生产成本

21英寸彩管	440元/只	21英寸彩电	1130元/只
25英寸彩管	720元/只	25英寸彩电	1700元/只

信息产业部 1999年4月2日

关于制止彩色显像管、彩色电视机不正当价格竞争的试行办法的通知

各省、自治区、直辖市及计划单列市物价局（委员会），电子工业主管部门：

为了制止彩色显像管、彩色电视机行业的不正当价格竞争行为，维护正常的市场竞争秩序，国家计委、信息产业部制定了《关于制止彩色显像管、彩色电视机不正当价格竞争的试行办法》（以下简称《办法》），现印发给你们，请认真贯彻执行，并就有关事项通知如下：

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公文 收46号 99年4月14日

重大
制
绍，此次研制成功
产品是“863计划
研制系列化、多样
标志性产品，其产
E操作系统，完成
移动通讯、网上浏
数据同步与信息
可以通过电话线
因特网，具有可收
握交换、传真发送

国家发展计划委员会 信息产业部 文件

计价格〔1999〕264号

国家计委、信息产业部印发关于制止彩色显像管、彩色电视机不正当价格竞争的试行办法的通知

各省、自治区、直辖市及计划单列市物价局(委员会),电子工业主管部门:

为了制止彩色显像管、彩色电视机行业的不正当价格竞争行为,维护正常的市场竞争秩序,国家计委、信息产业部制定了《关于制止彩色显像管、彩色电视机不正当价格竞争的试行办法》(以下简称《办法》),现印发给你们,请认真贯彻执行,并就有关事项通知如下:

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一、近几年来，由于产品供过于求，市场竞争日趋激烈，彩色电视机价格大幅度下降。在降价竞争中，一些彩色电视机、彩色显像管生产企业以低于生产成本的价格进行销售，扰乱了正常的价格秩序，损害了其他经营者和消费者的合法权益。各地价格、电子主管部门要会同计划、经贸等有关部门，加强领导，密切配合，共同做好《办法》的贯彻实施工作。

二、遵照国务院领导同志的指示精神，国家计委、信息产业部决定，将彩色显像管和彩色电视机作为1999年制止低价倾销、依法规范市场秩序的重点品种。各地要加强监督检查，检查的主要内容是：彩色显像管、彩色电视机生产企业的出厂价格是否低于其生产成本，经销企业的销售价格是否低于其进货成本；是否采取折扣、补贴、多给数量等手段低价销售；是否采取使用走私进口原材料和零配件、降低性能指标、以次充好、虚报成本等手段低价销售。

三、彩色显像管和彩色电视机生产企业要严格执行《办法》的各项规定，自觉规范价格行为，据实、准确记录与核定生产成本及进货成本，严禁少摊费用，虚置成本。同时要对有无不正当价格竞争行为进行自查自纠，并积极向价格主

003

管部门举报不正当价格竞争行为。

四、各地在贯彻实施《办法》和监督检查过程中存在的问题，请及时报告国家计委和信息产业部。

附件：关于制止彩色显像管、彩色电视机不正当价格竞争的试行办法

中华人民共和国国家发展计划委员会

中华人民共和国信息产业部

国家计委　　信息产业部

一九九九年三月十五日

主题词：彩电　价格办法　通知

抄送：国务院办公厅、国家经贸委、财政部、海关总署，各省、自治区、直辖市及计划单列市计委（计经委）

附件：

关于制止彩色显像管、彩色电视机不正当价格竞争的试行办法

第一条　为制止彩色显像管、彩色电视机行业的不正当价格竞争行为，维护公平、公开、合法的市场竞争和正常的价格秩序，维护国家利益，保护经营者和消费者的合法权益，根据《中华人民共和国价格法》（以下简称《价格法》）及国家其他有关法律，制定本办法。

第二条　凡在中华人民共和国境内从事生产、销售彩色显像管、彩色电视机的经营者，均应执行本办法。

第三条　本办法所称的不正当价格竞争行为是指，经营者为了排挤竞争对手或独占市场，以低于本企业成本销售，或者采取其它不正当手段降低成本低价销售，扰乱正常的生产经营秩序，损害国家利益或其它经营者合法权益的行为。

第四条　彩色显像管、彩色电视机经营者的下列行为属于不正当价格竞争行为：

（一）生产企业的出厂价格低于其同一时期生产成本，经销企业的销售价格低于其同一时期进货成本；

（二）采取折扣、补贴、多给数量等方式，使生产企业的实际出厂价格低于本企业生产成本，经销企业实际销售价格低于本企业进货成本；

（三）使用走私进口原材料和零配件、降低性能标准、以次充好、虚报成本等手段低价销售；

（四）市场份额占较大优势的彩色显像管购买者利用其优势地位迫使彩色显像管生产企业低于其生产成本销售产品；

（五）采取其它方式，使生产企业的实际出厂价格低于其同一时期生产成本，或经销企业的实际销售价格低于其同一时期进货成本。

第五条　信息产业部定期发布彩色显像管、彩色电视机主要品种、规格的行业平均生产成本。国家计委会同信息产业部确定和公布合理的下浮幅度。

第六条　生产企业的出厂价格原则上不应低于行业平均生产成本；经销企业的销售价格不应低于正常进货成本。

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第七条　生产企业以低于发布的行业平均生产成本销售，经销企业以低于其同期进货成本销售，造成市场价格秩序混乱、损害其它生产企业和经销企业利益的，受损害的生产企业和经销企业可向国家计委或者省、自治区、直辖市政府价格主管部门举报；政府价格主管部门根据情况立案调查。

第八条　举报人应当据实反映情况，提供被举报人不正当价格竞争行为的事实材料和被损害的情况。被举报的经营者，应当配合政府价格主管部门调查，如实提供相关的帐薄、单据、凭据以及其它资料。

第九条　经调查认定，被举报的彩色显像管、彩色电视机经营者确有本办法第四条所列不正当价格竞争行为的，由政府价格主管部门责令改正，并视具体情况依据《价格法》进行下列处罚：

（一）予以警告；

（二）处以罚款；

（三）责令其停业整顿；

（四）提请工商行政管理机关吊销其营业执照。

第十条　价格主管部门实施检查时，首先应以生产、

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经营者的个别成本为主要判定依据。当个别成本难以认定时，以行业平均成本和合理的下浮幅度为主要判定依据。

第十一条　彩色显像管、彩色电视机经营者应当建立、健全内部价格管理及成本、费用核算制度，据实、准确记录与核定生产成本及进货成本，不得弄虚作假。

第十二条　各级电子工业主管部门及彩色显像管、彩色电视机行业协会应当督促彩色显像管、彩色电视机经营者执行本办法。对生产企业和经销企业违反本办法的，规劝其改正；规劝无效的，可向政府价格主管部门举报，要求立案调查。

第十三条　本办法由国家计委负责解释。

第十四条　本办法自 1999 年 4 月 1 日起施行。

008

公文 收57号 99年4月21日

信息产业部文件

信部运〔1999〕287号

关于发布彩色显像管、彩色电视机部分品种行业平均生产成本的通知

彩虹电子集团公司文件阅办单

集团拟办意见：	部拟办意见：
领导指示：	

传阅时间	签字	传阅时间	签字	传阅时间	签字	传阅时间	签字

要求完成时间	处理结果
	承办单位领导签字

008

公文 收51号 99年4月21日

信息产业部文件

信部运〔1999〕287号

关于发布彩色显像管、彩色电视机部分品种行业平均生产成本的通知

各彩管、彩电生产企业：

为了制止彩色显像管、彩色电视机行业的不正当价格竞争行为，维护正常的市场秩序，根据国家计委、信息产业部《关于制止彩色显象管、彩色电视机不正当价格竞争的试行办法》，我部依据各主要彩管、彩电生产企业报送的成本资料，结合典型企业的调研情况，对21英寸、25英寸两个品种规格彩管、彩电的行业平均生产成本进行了测算，现予发布（见附表）。请各彩管、彩电生产企业认真贯彻执行。生产企业以低于发布的行业平均生产成本销售，造成市场秩序混乱、损害其他生产企业利益的，受损害的企业可向国家计委、或者省、自

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治区、直辖市价格主管部门举报。对经调查认定，确有不正当价格竞争行为的由政府价格主管部门责令改正，并视具体情况进行处罚。

本通知自发布之日起执行。

附件：附表

中华人民共和国信息产业部

一九九九年四月[illegible]日

主题词：彩管 彩电 成本 通知

抄 送：国家计委，国家经贸委，国家工商行政管理局。

信息产业部办公厅 一九九九年四月十二日印发

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附表：

部分规格品种彩管、彩电行业平均生产成本

21英寸彩管	440元／只
25英寸彩管	720元／只
21英寸彩电	1130元／台
25英寸彩电	1700元／台

备　　考　　表

全　宗　号：

案卷目录号：

案卷顺序号：

本卷(或簿本)内的文件共有 10 张

本卷(或簿本)内的缺点或其他情况

立卷人：王跃芹　　检查人：

2000 年 8 月 15 日　　年　月　日

03513×824

APPENDIX 7

EXHIBIT C

December 20, 2017

Certification

Park IP Translations

This is to certify that the attached translation is, to the best of my knowledge and belief, a true and accurate translation from Chinese into English of: **关于**发布彩色显像管、彩色电视机部分品种行业平均生产成本的通知



Hanna Kang

Project Manager

Project Number: BBLLP_1712_051

15 W. 37th Street 8th Floor
New York, NY 10018
212.581.8870
ParkIP.com

File No.	Catalogue No.	Record No.	Sequence No.
	[illegible]	2	3

P5

Document of the Ministry of Information Industry
Xin Bu Yun [1999] No. 287

Notification of Publishing Industrial Average Production Costs for Some Types of Color CRTs and Color TVs

To prevent actions of unfair price competition in the color CRT and color TV industry and maintain a normal market order, this Ministry performed estimation on the industrial average production costs of two types of color CRTs and color TVs, i.e. 21 inches and 25 inches, pursuant to the Trial Measures to Prevent Unfair Price Competition Regarding Color CRTs and Color TVs by the State Planning Commission and the Ministry of Information Industry. The estimation was made according to cost materials reported by major manufacturers of color CRTs and color TVs and combined with the results of investigation on typical enterprises. The estimation is hereby published (see the attached table). All color CRT and color TV manufacturing enterprises are asked to seriously implement the estimation. In the case where a manufacturing enterprise sells the products at prices lower than the published industrial average production costs to cause market disorders and harm the interests of other manufacturing enterprises, a harmed enterprise may file a report with the State Planning Commission or a competent department in charge of prices of a province, autonomous region or municipality directly under the Central Government. In the case where it is confirmed through investigation that there is indeed an action of unfair price competition, a competent government department in charge of prices shall order the responsible party to correct and impose penalties according to specific situations.

Electronic Industry Archives	
Copy	No. 2017048

This Notification shall go into effect as of the date of issuance.

Attachment: Attached Table

April 2, 1999
(Seal of the Ministry of Information Industry of the People's Republic of China)

Keywords: color CRT, color TV, cost, notification

Cc: The State Planning Commission, the State Economic and Trade Commission, and the State Administration for Industry and Commerce.

The General Office of the Ministry of Information Industry

Printed and distributed on April 12, 1999

Attached Table:

Industrial average production costs for Some Sizes and Types of Color CRTs and Color TVs

21” Color CRT	440 Yuan/piece
25” Color CRT	720 Yuan/piece
21” Color TV	1130 Yuan/set
25” Color TV	1700 Yuan/set

信息产业部文件

信部运〔1999〕287号

关于发布彩色显像管、彩色电视机部分品种行业平均生产成本的通知

为了制止彩色显像管、彩色电视机行业的不正当价格竞争行为，维护正常的市场秩序，根据国家计委、信息产业部《关于制止彩色显象管、彩色电视机不正当价格竞争的试行办法》，我部依据各主要彩管、彩电生产企业报送的成本资料，结合典型企业的调研情况，对21英寸、25英寸两个品种规格彩管、彩电的行业平均生产成本进行了测算，现予发布（见附表）。请各彩管、彩电生产企业认真贯彻执行。生产企业以低于发布的行业平均生产成本销售，造成市场秩序混乱、损害其他生产企业利益的，受损害的企业可向国家计委、或者省、自治区、直辖市价格主管部门举报。对经调查认定，确有不正当

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复印 2017048 号

价格竞争行为的由政府价格主管部门责令改正，并视具体情况进行处罚。

本通知自发布之日起执行。

附件：附表

中华人民共和国信息产业部

一九九九年四月二日

主题词：彩管　彩电　成本　通知

抄　送：国家计委，国家经贸委，国家工商行政管理局。

信息产业部办公厅　　一九九九年四月十二日印发

3

情

附表：

部分规格品种彩管、彩电行业平均生产成本

21英寸彩管	440元／只
25英寸彩管	720元／只
21英寸彩电	1130元／台
25英寸彩电	1700元／台

发

APPENDIX 8

EXHIBIT E

December 20, 2017

Certification

Park IP Translations

This is to certify that the attached translation is, to the best of my knowledge and belief, a true and accurate translation from Chinese into English of: **关于发布彩色电视机部分品种行业平均生产成本的通知**



Hanna Kang

Project Manager

Project Number: BBLLP_1712_051

15 W. 37th Street 8th Floor
New York, NY 10018
212.581.8870
ParkIP.com

File No.	Catalogue No.	Record No.	Sequence No.
	[illegible]	14	3

Document of the Ministry of Information Industry
Xin Bu Yun [2000] No. 789

Notification of Publishing Industrial Average Production Costs for Some Types of Color TVs

To color TV manufacturing enterprises:

To prevent actions of unfair price competition in the color TV industry and maintain a normal market order, the industrial average production costs of three types of color TVs, i.e. 21 inches, 25 inches, and 29 inches, are hereby published (see the attached table for details) pursuant to the Trial Measures to Stop Unfair Price Competition Regarding Color CRTs and Color TVs by the State Planning Commission and the Ministry of Information Industry. All color TV manufacturing enterprises are asked to seriously implement the costs. In the case where a manufacturing enterprise sells the products at prices lower than the published industrial average production costs to cause market disorders and harm the interests of other manufacturing enterprises, a harmed enterprise may file a report with the State Planning Commission or a competent department in charge of prices of a province, autonomous region or municipality directly under the Central Government. In the case where it is confirmed through investigation that there is indeed an action of unfair price competition, a competent government department in charge of prices shall order the responsible party to correct and impose penalties according to specific situations.

Electronic Industry Archives	
Copy	No. 2017053

This Notification shall go into effect as of the date of issuance.

Attached Table: Industrial average production costs for Some Sizes of Color TVs

August 25, 2000
(Seal of the Ministry of Information Industry of the People's Republic of China)

Keywords: color TV, production cost, notification

Cc: The State Planning Commission, the State Economic and Trade Commission, and the State Administration for Industry and Commerce.

The General Office of the Ministry of Information Industry

Printed and distributed on August 25, 2000

Attached Table: Industrial average production costs for Some Sizes of Color TVs

21”	970 Yuan/set
25”	1420 Yuan/set
29”	2170 Yuan/set

全宗号 目录号 案卷号 件号
总000之 14 3

信息产业部文件

信部运〔2000〕789号

关于发布彩色电视机部分品种行业平均生产成本的通知

各彩电生产企业：

为了制止彩色电视机行业的不正当价格竞争行为，维护正常的市场秩序，按照国家计委、信息产业部《关于制止彩色显像管、彩色电视机不正当价格竞争的试行办法》，现将21英寸、25英寸、29英寸三种规格彩电的行业平均成本予以发布（详见附表）。请各彩电生产企业认真贯彻执行。生产企业以低于发布的行业平均成本销售造成市场秩序混乱、损害其它生产企业利益的，受损害的企业可以

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复印 2011053 号

向国家计委或者省、自治区、直辖市价格主管部门举报。对经调查认定，确有不正当价格竞争行为的由政府价格主管部门责令改正，并视具体情况进行处罚。

本通知自发布之日起执行。

附表：部分规格彩电行业平均生产成本

二000年八月二十五日

主题词：彩电　生产成本　通知

抄　送：国家计委，国家经贸委，国家工商行政管理局。

信息产业部办公厅　　二000年八月二十五日印发

附表：

部分规格彩电行业平均生产成本

21英寸	970元／台
25英寸	1420元／台
29英寸	2170元／台

APPENDIX 9

EXHIBIT F

December 20, 2017

Certification

Park IP Translations

This is to certify that the attached translation is, to the best of my knowledge and belief, a true and accurate translation from Chinese into English of: **关于发布彩色显像管部分品种行业平均生产成本的通知**



Hanna Kang

Project Manager

Project Number: BBLLP_1712_051

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ParkIP.com

File No.	Catalogue No.	Record No.	Sequence No.
	[illegible]	14	4

Document of the Ministry of Information Industry
Xin Bu Yun [2000] No. 843

Notification of Publishing Industrial Average Production Costs for Some Types of Color CRTs

To color CRT manufacturing enterprises:

To prevent actions of unfair price competition in the color CRT industry and maintain a normal market order, the industrial average production costs of three types of color CRTs, i.e. 21 inches, 25 inches, and 29 inches, are hereby published (see the attached table for details) pursuant to the Trial Measures to Prevent Unfair Price Competition Regarding Color CRTs and Color TVs by the State Planning Commission and the Ministry of Information Industry. All color CRT manufacturing enterprises are asked to seriously implement the costs. In the case where a manufacturing enterprise sells the products at prices lower than the published industrial average production costs to cause market disorders and harm the interests of other manufacturing enterprises, a harmed enterprise may file a report with the State Planning Commission or a competent department in charge of prices of a province, autonomous region or municipality directly under the Central Government. In the case where it is confirmed through investigation that there is indeed an action of unfair price competition, a competent government department in charge of prices shall order the responsible party to correct and impose penalties according to specific situations.

Electronic Industry Archives	
Copy	No. 2017052

This Notification shall go into effect as of the date of issuance.

Attachment: Attached Table

September 13, 2000
(Seal of the Ministry of Information Industry of the People's Republic of China)

Keywords: color CRT, production cost, notification

Cc: The State Planning Commission, the State Economic and Trade Commission, and the State Administration for Industry and Commerce.

The General Office of the Ministry of Information Industry

Printed and distributed on September 14, 2000

Attached Table: Industrial average production costs for Some Sizes of Color CRTs

21” (regular flat)	410 Yuan/piece
25” (regular flat)	670 Yuan/piece
29” (ultra flat)	1135 Yuan/piece

超3000元 14 4

信息产业部文件

信部运〔2000〕843号

关于发布彩色显像管部分品种行业平均生产成本的通知

各彩管生产企业：

为了制止彩色显像管行业的不正当价格竞争行为，维护正常的市场秩序，按照国家计委、信息产业部《关于制止彩色显像管、彩色电视机不正当价格竞争的试行办法》，现将21英寸、25英寸、29英寸三种规格彩管的行业平均成本予以发布（详见附表）。请各彩管生产企业认真贯彻执行。生产企业以低于发布的行业平均成本销售造成市场秩序混乱、损害其它生产企业利益的，受损害的企业可以

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向国家计委或者省、自治区、直辖市价格主管部门举报。对经调查认定，确有不正当价格竞争行为的由政府价格主管部门责令改正，并视具体情况进行处罚。

本通知自发布之日起执行。

附件：附表

二000年九月十三日

主题词：彩管　生产成本　通知

抄　送：国家计委，国家经贸委，国家工商行政管理局。

信息产业部办公厅　　二000年九月十四日印发

报。

格主

附表：部分规格彩管行业平均生产成本

21 英寸（普平）	410 元/只
25 英寸（普平）	670 元/只
29 英寸（超平）	1135 元/只

印发

EXHIBIT 8

In the Matter Of:

In Re - CRT Antitrust Litigation

JANET NETZ

June 09, 2022



VOLUME 1
PAGES: 1-73
EXHIBITS: See Index

UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA
OAKLAND DIVISION

IN RE: CATHODE RAY TUBE (CRT) ANTITRUST LITIGATION	
THIS DOCUMENT RELATES TO:	Master File No. 07-cv-05944-JST
ALL INDIRECT PURCHASER ACTIONS	MDL No. 1917

VIDEOTAPED DEPOSITION of JANET S. NETZ, PH.D.

- CONDUCTED BY VIDEOCONFERENCE -

Thursday, June 9, 2022

12:00 p.m. Eastern Daylight Time

Michelle Keegan, RMR, CRR

Lexitas

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LAW OFFICE OF VAUGHN R. WALKER
Honorable Vaughn R. Walker
P.O. Box 26250
San Francisco, California 94126
(415) 871-2995
Special Master

Also Present:
Aydaline Garcia, Videographer

12:06:48 Q. And are there any other areas of expertise
12:06:51 in which you're offering opinions in this matter?
12:06:58 A. I guess you might consider that I'm also
12:07:02 an expert at applied microeconomics.
12:07:07 Q. Do you consider yourself an expert on
12:07:09 Chinese law?
12:07:10 A. No, I do not.
12:07:11 Q. Do you have any prior experience,
12:07:15 education or training in analyzing or interpreting
12:07:18 Chinese law?
12:07:19 A. I do not.
12:07:19 Q. And if you look on page 8 of your report,
12:07:26 you confirm that you're not offering an opinion on
12:07:28 the legal significance of any Chinese laws or
12:07:31 regulations. Correct?
12:07:32 A. I'm not sure where you are in my report.
12:07:42 MR. GOLDBERG: That would be --
12:07:43 A. Again, is that page 8 of the hardcover or
12:07:46 of the PDF?
12:07:48 Q. Correct. Page 8 of 15 of your report.
12:07:57 MR. GOLDBERG: Take whatever time you need
12:07:58 to review page 8 of 15 in Exhibit 8552 to identify
12:08:05 the language that Mr. Lucarelli is referring to.
12:08:13 A. As I say in my report, I cannot offer a
12:08:17 legal interpretation of the law. I am not

12:46:16 1 objections and my instructions.
12:46:17 2 If you want to bring this to the special
12:46:22 3 master, who is the person to address this, Judge
12:46:25 4 Walker is available. And we should bring it to
12:46:28 5 Judge Walker. Or you can continue this way.
12:46:31 6 You've made your record. And you can go
12:46:34 7 to Judge Tigar later and say that nasty
12:46:37 8 Mr. Goldberg interrupted the deposition. We
12:46:39 9 should get another deposition. And you'll see
12:46:42 10 what he says.
12:46:46 11 MR. LUCARELLI: I agree we've both made
12:46:47 12 our record. So we're ready to proceed.
12:46:58 13 BY MR. LUCARELLI:
12:46:58 14 Q. Doctor, before the break, I was asking you
12:47:01 15 about your damage model and price floors set by
12:47:04 16 the Chinese government.
12:47:06 17 Prior to reviewing the expert reports of
12:47:08 18 Professor Clarke and Ms. Guerin-Calvert submitted
12:47:10 19 in March of this year, were you aware of Chinese
12:47:14 20 regulations that may have impacted the price of
12:47:17 21 CRTs sold in China?
12:47:19 22 MR. GOLDBERG: I'm going to object to the
12:47:20 23 form of the question. I won't instruct Dr. Netz
12:47:25 24 not to answer the question.
12:47:26 25 A. No, I was not aware of Chinese price

floors.

Q. And you don't know whether the price floors cited in Professor Clarke's report were the only price floors announced by the Chinese government. Correct?

A. That is correct. I do not know that to be the case.

Q. And you don't know how long the announced price floors cited in Professor Clarke's report were intended to be in effect. Correct?

A. I'm not sure I understand your question. Are you talking about price floors generally or specific price floors?

Q. As to any of the price floors in the announcements cited in Professor Clarke's report, you don't know how long those price floors were in effect. Correct?

A. I'm still not sure which price floors you're referring to.

Q. Fair -- fair enough.

And you don't know whether some of the but-for CPT prices implied by your overcharge model were below a relevant price floor set by the Chinese government. Right?

MR. GOLDBERG: I object to the form of the

EXHIBIT 9

Highly Confidential

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

OAKLAND DIVISION

IN RE: CATHODE RAY TUBE (CRT) ANTITRUST LITIGATION This document relates to: ALL INDIRECT PURCHASER ACTIONS	Master File No. 07-CV-5944-JST MDL No. 1917

JANET S. NETZ, PH.D REBUTTAL TO SUPPLEMENTAL EXPERT REPORT OF MARGARET E. GUERIN-CALVERT AND EXPERT REPORT OF DONALD CLARKE

April 27, 2022

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I. Introduction

A. Qualifications

I, Janet S. Netz, am a founding partner of applEcon, LLC. I have been a tenured Associate Professor of Economics at Purdue University and a Visiting Associate Professor at the University of Michigan. I received a B.A. (1986) from the University of California, Berkeley, cum laude, and an M.A. (1990) and Ph.D. (1992) from the University of Michigan, all in Economics. My doctoral fields of study were Industrial Organization – the study of firm interaction and market performance – and International Trade and Finance.

I have taught Industrial Organization at the undergraduate and doctoral level; Antitrust and Regulation at the undergraduate level; Microeconomic Theory at the undergraduate and master's level; and International Economics at the undergraduate and master's level. My research has focused on competitive interactions of firms and strategies firms can use to increase profits as well as the resulting impact on firms and the market. I have published in peer-reviewed scholarly journals and have presented my research at many conferences and seminars. I provide my academic employment and publication histories in my curriculum vitae, which is attached as Exhibit A.

I have testified at trial and by affidavit or declaration in both named plaintiff and class action matters related to antitrust, consumer protection, and business practices, especially with regard to the economic impact of conduct, for over fifteen years. I have specific knowledge of the CRT industry through my previous work in this matter, which includes the following filings:

1. Declaration of Janet S. Netz, Ph.D. in Support of Motion of Indirect-Purchaser Plaintiffs for Class Certification, October 1, 2012[1] ("Netz Class Cert Declaration")
2. Rebuttal Declaration of Janet S. Netz, Ph.D. in Support of Motion of Indirect-Purchaser Plaintiffs for Class Certification, February 15, 2013[2] ("Netz Class Cert Rebuttal")
3. Expert Report of Janet S. Netz, Ph.D., April 15, 2014[3] ("Netz Expert Report")
4. Rebuttal Expert Report of Janet S. Netz, Ph.D., September 26, 2014[4] ("Netz Expert Rebuttal Report")

[1] Netz, Janet S., 01 October 2012, Declaration of Janet S. Netz, Ph.D., In Support of Motion of Indirect-Purchaser Plaintiffs For Class Certification, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Netz Class Cert Declaration").

[2] Netz, Janet S., 15 February 2013, Rebuttal Declaration of Janet S. Netz, Ph.D., in Support of Motion of Indirect-Purchaser Plaintiffs for Class Certification, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Netz Class Cert Rebuttal").

[3] Netz, Janet S., 15 April 2014, Expert Report of Janet S. Netz, Ph.D, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Netz Expert Report").

I filed errata to my expert report on July 3, 2014. Netz, Janet S., 03 July 2014, Errata to the Expert Report of Janet S. Netz, Ph.D, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Netz Expert Report Errata"). When I reference my expert report, it is inclusive of the updated figures in my errata.

I provide a complete list of the cases on which I have testified and consulted in my curriculum vitae, which is attached as Exhibit A.

applEcon bills my work on this case at the rate of US$800 per hour. My and applEcon's compensation is independent of my opinions or the outcome of the case.

B. My assignment

Plaintiffs' counsel asked me to evaluate the arguments made by Ms. Margaret E. Guerin-Calvert in her March 16, 2022 Supplemental Expert Report ("Guerin-Calvert Supplemental Report").[5] Briefly, Irico's counsel asked Ms. Guerin-Calvert to make four assumptions and to assess their implications on my analyses and conclusions, including my damages estimates.[6] Ms. Guerin-Calvert also relies on the opinions expressed in Professor Clarke's March 16, 2022 Expert Report ("Clarke Report").[7] Ms. Guerin-Calvert also states that she has "reaffirm[ed] the conclusions and underlying analyses presented in [her] previous reports in this matter[,]"[8] and has "reviewed the conclusions and underlying analyses presented in the expert reports that Professor Willig has previously submitted in his matter, considered and assessed the analyses detailed in his reports…and adopt[ed] his conclusions and the underlying analyses in full as reflecting my own expert opinion."[9]

I have evaluated the supplemental arguments made by Ms. Guerin-Calvert about my work based on Irico's counsel's four assumptions and find them unpersuasive in addressing my previous analyses and conclusions. I present my conclusions and reasoning in the remainder of this report.

I list the additional confidential and public documents I have relied upon in Exhibits B and C, respectively.

I have also reviewed Ms. Guerin-Calvert's previous reports[10] and Professor Willig's previous reports,[11] which Ms. Guerin-Calvert has "adopted." In my Expert Rebuttal Report, I have already

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[4] Netz, Janet S., 26 September 2014, Rebuttal Expert Report of Janet S. Netz, Ph.D., In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Netz Expert Rebuttal Report").

[5] Guerin-Calvert, Margaret E., 16 March 2022, Supplemental Expert Report of Margaret E. Guerin-Calvert, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Guerin-Calvert Supplemental Report").

Ms. Guerin-Calvert filed errata to her Supplemental Report on March 21, 2022. Her errata updated damages numbers reported in her Supplemental Report. For purposes of this report, when I reference Ms. Guerin-Calvert's damages claims, it is with respect to the updated numbers in her errata.

[6] Guerin-Calvert Supplemental Report, ¶8.

[7] Clarke, Donald, 16 March 2022, Expert Report of Donald Clarke, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Clarke Expert Report").

[8] Guerin-Calvert Supplemental Report, ¶13.

[9] Guerin-Calvert Supplemental Report, ¶14, emphasis added.

[10] See:

explained in detail why Defendants' experts' previous analyses and opinions – including those of Ms. Guerin-Calvert and Professor Willig – are flawed. If needed, I am prepared to explain at trial why the surrebuttal reports Ms. Guerin-Calvert and Professor Willig submitted after my Expert Rebuttal Report fail to rebut the reliability of my conclusions, including as they pertain to Irico.

C. Summary of my conclusions

The arguments in Ms. Guerin-Calvert's Supplemental Report are built on "assumptions" that Irico's counsel asked her to make. They are not based on new evidence. As such, they are essentially thought experiments designed by Irico's counsel. The assumptions regarding "liability" are legal assumptions outside the scope of my expertise. I do not have an opinion as to the merit of any legal assumptions. Instead, I evaluated Ms. Guerin-Calvert's arguments by accepting, as she did, Irico's counsel's requested assumptions and considered the conclusions Ms. Guerin-Calvert drew from these assumptions in light of the case evidence and economic principles.

In summary, after reviewing Ms. Guerin-Calvert's arguments, I conclude:

- My approach in estimating damages, consistent with my experience and my understanding of the experience of other expert economists in similar or analogous settings, was to calculate damages caused by the CRT cartel as a whole, rather than for individual conspirators and products. The assumptions that "IPPs cannot demonstrate that Irico participated in the alleged cartel with respect to either CDTs or CPTs prior to August 1998" and that "Irico did not produce any CPTs with a diameter larger than 29 inches during the class period" are irrelevant when estimating damages caused by the cartel to the class. Nonetheless, time-period and product adjustments to my damages estimate are arithmetic and can be accommodated by my methodology.
- The assumption that "price floors set by the Chinese government for at least some categories of CPTs during at least some portions of the class period represent a potential constraint on but-for pricing" is based on both legal and economic assumptions. I do not

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- Guerin-Calvert, Margaret E., 05 August 2014, Expert Report of Margaret E. Guerin-Calvert, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).
- Guerin-Calvert, Margaret E., 23 September 2014, Errata to The Expert Report of Margaret E. Guerin-Calvert, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).
- Guerin-Calvert, Margaret E., 06 November 2014, Expert Surrebuttal Report of Margaret E. Guerin-Calvert, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Guerin-Calvert Surrebuttal Report").

[11] See:

- Willig, Robert D., 05 August 2014, Expert Report of Robert D. Willig, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Willig Report").
- Willig, Robert D., 06 November 2014, Expert Surrebuttal Report of Robert D. Willig, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division) (Hereinafter "Willig Surrebuttal Report").

make conclusions on whether these price floors are legally binding or appropriate. I did review the Pricing Documents attached to Professor Clarke's report to inform the economic analysis of the implication of a price floor, assuming that these documents create a "price floor", a conclusion about which I do not offer an opinion. My reading of the documents, however, suggests that Professor Clarke and Ms. Guerin-Calvert have identified the wrong price floor. Ms. Guerin-Calvert's conclusions that implied but-for prices are below this possibly erroneous price floor do not hold when implied but-for prices are properly calculated to account for the shape of the CRT (flat versus round). Ms. Guerin-Calvert at best finds a single, questionable, instance (for 21-inch CPTs in 1999 Q2) where the but-for price implied by my damages model might be below the possibly erroneous price floor. This single observation represents less than 0.1% of the sales included during the damages period of my model and is one out of 850 CPT size-quarter observations.

- The assumption that "horizontal communications related to CPTs in which Irico allegedly participated were not directed at North American customers" does not rebut that Irico participated in the cartel or demonstrate that my damages estimates are unreliable. Applying economic principles to the complete body of evidence demonstrates that the cartel had the incentive and ability to raise the prices of CRTs consumed in North America and that the cartel did in fact raise the prices of CRTs consumed in North America.[12]

In the rest of this report, I discuss the reasons and reasoning underlying my conclusions.

II. The assumption that Irico did not participate in the cartel prior to August 1998 does not change my opinions on classwide damages

Ms. Guerin-Calvert "was asked to assume that IPPs cannot demonstrate that Irico participated in the alleged cartel with respect to either CDTs or CPTs prior to August 1998."[13] She was furthermore asked to "assume that Irico is not liable for any damages allegedly incurred by the IPPs prior to August 1998."[14]

Irico has not produced evidence indicating that it did not participate in the cartel prior to August 1998. Cartel meeting notes indicate that Irico was participating in the ongoing cartel at least as of August 1998, and those notes do not suggest that Irico was a new entrant to the ongoing cartel.[15] Moreover, I understand that plaintiffs' counsel recently found evidence in Irico's and BMCC's productions of Irico's meetings with other Chinese CRT makers prior to 1998.[16]

[12] Netz Expert Rebuttal Report.

[13] Guerin-Calvert Supplemental Report, ¶17.

[14] Guerin-Calvert Supplemental Report, ¶17.

[15] Chunghwa Picture Tubes (Fuzhou), Yeh, Chung-Cheng (Alex), 11 August 1998, Mainland China CDT MAKER Contact Meeting [Certified Translation], CHU00030661 - CHU00030663, at 0661.01E.

[16] 23 February 2022, Indirect Purchaser Plaintiffs' Objections and Responses to the Irico Defendants' Second Set of Interrogatories, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division), Response to Interrogatory No. 2.

I estimate damages to class members over the entire class period, March 1, 1995 through November 25, 2007, to be $2.769 billion, including $2.026 billion in CDT damages and $743 million in CPT damages.[17] I do not portion out damages to individual conspirators, nor does Ms. Guerin-Calvert.

As Ms. Guerin-Calvert demonstrated, my damages estimation method can easily accommodate different cartel periods depending on the Court's findings. Should Irico be found not legally liable for any cartel damages prior to August 1998, my adjusted damages estimate to class members for the period August 1, 1998 through November 25, 2007 would be $1.621 billion, including $1.136 billion in CDT damages and $485 million in CPT damages.[18]

III. The assumption that Irico did not manufacture CPTs with a diameter larger than 29 inches from March 1, 1995 to November 25, 2007 does not change my opinions on classwide damages

Irico's counsel also asked Ms. Guerin-Calvert "to assume that Irico did not produce any CPTs with a diameter larger than 29 inches during the class period."[19] Whether Irico produced CPTs larger than 29 inches during the class period is irrelevant to the calculation of damages when damages are calculated for the cartel as a whole.

As Ms. Guerin-Calvert demonstrated, my damages estimation method can easily exclude individual cartelized products depending on the Court's findings. CPTs larger than 29 inches in diameter account for $161 million of my damages estimate, so my damages estimate would be reduced from $2.769 billion to $2.607 billion should the Court find Irico not liable for cartel damages arising from CPTs larger than 29 inches.[20]

IV. Ms. Guerin-Calvert's analysis of the assumption that Irico was subject to a price "floor" is flawed and does not change my opinion that my damages model is economically sound

Ms. Guerin-Calvert was asked to assume that Irico and other Chinese manufacturers were required to price specific CPT products above a price floor set by the Chinese government.

Ms. Guerin-Calvert's analysis rests on eight Pricing Documents that Irico's expert, Professor Clarke, attaches to his report. Professor Clarke opines that "[t]he regulatory framework constituted by the Pricing Documents has the status of enforceable law in the Chinese legal system." He then lists what he refers to as price "floors."[21]

Ms. Guerin-Calvert purports to show that the but-for prices implied by my damages model are below the price floor in three instances. Based on her analysis, she concludes that "Dr. Netz's

[17] Netz Expert Report Errata, Exhibit ER-81.

[18] Guerin-Calvert, Margaret E., 21 March 2022, Errata to the Supplemental Expert Report of Margaret E. Guerin-Calvert, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division), Table F-2R.

[19] Guerin-Calvert Supplement Report, ¶22.

[20] Guerin-Calvert Supplemental Report, Table G-1.

[21] Clarke Report, ¶24.

failure to account for these floors in her overcharge model potentially is likely yet another reason why her overcharge model is unreliable, particularly where the average but-for prices of CPTs manufactured in China that are implied by her model are below the corresponding price floors."[22]

I have reviewed Ms. Guerin-Calvert's analyses, Professor Clarke's opinions, and the translated Pricing Documents attached to Professor Clarke's Report. I continue to conclude that my damages model is an economically reliable estimate of the classwide damages caused by the cartel.

A. The existence and level of price floors is ambiguous

In order to evaluate Ms. Guerin-Calvert's economic analysis of implications of my damages model in the presence of Chinese government price floors, I reviewed Professor Clarke's characterization of the price floors and the documents appended to his report, as well as Ms. Guerin-Calvert's characterization of these materials. I reviewed these materials to inform the proper industrial characteristics under which to implement a proper economic analysis.

In general, it appears that the purpose of the regulations is to prevent "dumping" – pricing of products below cost – in order to "to protect fair, open and legitimate market competition, to maintain a normal price order, and to safeguard legitimate rights and interests of business operators and consumers."[23] The pricing notices,[24] and Professor Clarke's and Ms. Guerin-Calvert's discussion of them, mention two production costs: (1) average industry production costs and (2) a manufacturer's own production costs.[25] These two cost measures are not equal, as production costs naturally vary among manufacturers. Any individual manufacturer will have production costs above or below the industry average depending on that firm's relative efficiency. A relatively efficient manufacturer could sell its products at prices below industry average production costs but above its own production costs.

Professor Clarke does not distinguish between these two cost measures in his report. To the contrary, he seems to conflate them when he summarizes the regulatory framework set out in the Pricing Documents attached to his report by stating that sanctions are based on a manufacturer's prices relative to industry-average costs:

> *Producers are required to submit information about costs to the regulator. The regulator then issues a document containing minimum prices. The producers may not price below*

[22] Guerin-Calvert Supplemental Report, ¶15c, emphasis added.

[23] 1998 Notice, Article 1 in Clarke Report, Appendix 2.

[24] 1998 Notice, Article 1 in Clarke Report, Appendix 2 and April 1999 Notice in Clarke Report, Appendix 5.

[25] See, e.g.,

- 1998 Notice, Articles 4 and 5 in Clarke Report, Appendix 2, as well as April 1999 Notice, Articles 3, 4 and 10 in Clarke Report, Appendix 5 for references to firm's own production costs.
- 1998 Notice, Articles 8, 9 and 10 in Clarke Report, Appendix 2, as well as April 1999 Notice, Articles 6, 7 and 10 in Clarke Report, Appendix 5 for references to industrial average production costs.

> *those minima. If they do, they are subject to a variety of sanctions, ranging from warnings to fines to the loss of their business license.*[26]

He then interprets the April 1999, August 2000, and September 2000 Cost Notifications, which report industry average production costs, to implement "the minimum prices for CRTs."[27]

Ms. Guerin-Calvert then relies on Professor Clarke's interpretation of the Pricing Documents to assume that the relevant "price floors" come from industry-average production cost tables set by the Chinese government rather than a manufacturer's actual costs.[28]

Two of Professor Clarke's Pricing Documents seem to lay out pricing guidelines, what Professor Clarke refers to as the 1998 Notice and the April 1999 Notice.[29] These Notices refer to industry-average production costs as constraints in principle, but only enumerate penalties when a manufacturer prices below its own production costs.

- The Notices state, "[e]x-factory prices of a manufacturing enterprise shall not be lower than the industrial average production costs in principle."[30]
- The Notices generally define "actions of unfair price competition" as "[e]x-factory prices of a manufacturing enterprise are lower than its [own] production costs."[31]
- The Notices define specific actions of unfair price competition[32] by making comparisons of price to a manufacturing enterprise's own production costs.[33]

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[26] Clarke Report, ¶13.

[27] Clarke Report, ¶24.

[28] Guerin-Calvert Report, footnote 51.

[29] See the description of documents i. and iv. in ¶6a of the Clarke Report.

[30] See 1998 Notice, Article 9 in Clarke Report, Appendix 2 and April 1999 Notice, Article 6 in Clarke Report, Appendix 5.

[31] See 1998 Notice, Article 4 in Clarke Report, Appendix 2 and April 1999 Notice, Article 3 in Clarke Report, Appendix 5.

[32] The April 1999 Notice, Article 4 in Clarke Report, Appendix 5 identifies specific unfair price actions for CRT manufacturers that price below their own costs: "The following actions of color CRT and color TV operators are actions of unfair price competition: I) Ex-factory prices of a manufacturing enterprise are lower than its production costs in the same period, and sales prices of a marketing enterprise are lower than its purchasing costs in the same period; (II) Actual ex-factory prices of a manufacturing enterprise are made to be lower than its production costs, and actual sales prices of a marketing enterprise are made to be lower than its purchasing costs by means of discounts, subsidies, and offering extra quantities; (III) Sales are made at low prices by means of using raw materials and parts and components imported through smuggling, lowering performance indexes, using shoddy products as good products, reporting false costs, etc.; (IV) A color CRT buyer with relatively great advantages in market shares uses its advantageous position to force a color CRT manufacturing enterprise to sell products at prices lower than its production costs; (V) Actual ex-factory prices of a manufacturing enterprise are made to be lower than its production costs in the same period, or actual sales prices of a marketing enterprise are made to be lower than its purchasing costs in the same period by using other means." (Emphases added.)

[33] See 1998 Notice, Article 5 in Clarke Report, Appendix 2 and April 1999 Notice, Article 4 in Clarke Report, Appendix 5.

- The Notices state that when a manufacturer sets its price below the industry average production costs, a harmed entity may notify the government and the government may open an investigation.[34]
- The portions of the Notices that enumerate potential punishments[35] refer to manufacturers that violate the specifically defined actions of unfair price competition based on comparisons to a manufacturing enterprise's own production costs.[36]

Indeed, the April 1999 Notice specifies that a firm's own production costs should be used. Industry average production costs should only be used "[w]hen it is difficult to confirm an individual cost."[37]

I cannot offer a legal interpretation of the law, but as an economist, my reading of the Notices suggests that the relevant metric, when available, is a firm's own production costs, not industry average production costs.

To the extent that the legally-relevant Chinese price floor is defined by manufacturers' own production costs, Ms. Guerin-Calvert's analysis is incorrect, as it compares implied but-for prices to industry average production costs.

B. Ms. Guerin-Calvert's price comparisons are for BMCC, not Irico

Ms. Guerin-Calvert calculates but-for prices based on price data from the actual, cartelized world and on my overcharge estimate from my damages model. Basically, she reduced the actual prices by the amount of the overcharge. Because Irico did not produce data until recently, Ms. Guerin-Calvert did not use Irico's actual prices. Instead, all of the data used in her calculation of but-for prices of CPTs manufactured in China come from CPTs manufactured by defendant Beijing Matsushita Color CRT Co., Ltd. (BMCC), not CPTs manufactured by Irico.[38]

Thus, Ms. Guerin-Calvert does not attempt to compare Irico's implied but-for prices to the price floor, despite the fact that the stated goal of her supplemental report is to have an "Irico focus."[39] If Ms. Guerin-Calvert wanted to test whether Irico's but-for prices implied by my model would subject Irico to sanctions under the Pricing Documents, she would need to compare Irico but-for

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[34] See 1998 Notice, Article 10 in Clarke Report, Appendix 2 and April 1999 Notice, Article 7 in Clarke Report, Appendix 5.

[35] The April 1999 Notice, Article 9 in Clarke Report, Appendix 5 enumerates penalties for those CRT manufacturers that violate Article 4: "In the case where a reported operator of color CRTs and color TVs is found through the investigation to truly have actions of unfair price competition listed in Article 4 of the Measures, the competent government department in charge of prices shall order the operator to correct the action and impose the following punishments according to the Price Law and specific situations: (I) Issue a warning; (II) Impose a fine; (III) Order the operator to suspend business for rectification; (IV) File a request with an administration for industry and commerce for revocation of its business license."

[36] See 1998 Notice, Article 12 in Clarke Report, Appendix 2, and April 1999 Notice, Article 9 in Clarke Report, Appendix 5.

[37] See April 1999 Notice, Article 10 in Clarke Report, Appendix 5.

[38] MT Picture Display, 22 April 2011, Sum of US AMT(Mil), MTPD-0122906.

[39] Guerin-Calvert Supplemental Report, ¶¶8, 15, and 16.

prices to Irico's own contemporaneous production costs during the period in which the price floors were in effect.[40]

C. Ms. Guerin-Calvert's price calculations are erroneous because they do not account for CPT shape

Ms. Guerin-Calvert compares implied but-for price of CPTs manufactured in China and compares those prices to industry-average CPT production costs for the following three size/quarter combinations: 21-inch CPTs in 1999 Q2 and 21-inch and 29-inch CPTs in 2000 Q4.

For the two size/quarter combinations for 2000 Q4 analyzed by Ms. Guerin-Calvert, the listed industry-average CPT production costs are specific to flat CPTs rather than round CPTs.[41] In her calculation of prices, Ms. Guerin-Calvert ignores this distinction and calculates the implied but-for price of all CPTs of the specified size to the corresponding industry-average production costs of flat CPTs. Flat CPTs are more expensive to produce and command a higher price than round CPTs,[42] so a proper comparison should include prices and costs only of flat CPTs.

The data underlying Ms. Guerin-Calvert's analyses do not contain information on CPT shape in 2000 Q4, and thus I cannot use these data to compare but-for prices to industry average production costs in this quarter. However, the same data do contain information on CPT shape in the following quarter, 2001 Q1. I calculate the price of flat CPTs using 2001 Q1 data and I come to the opposite conclusion as Ms. Guerin-Calvert: but-for prices implied by my model for flat CPTs are well above the industry average production costs contained in the Pricing Documents.

Table 1: Ms. Guerin-Calvert's Price Comparisons Corrected for Shape

Chinese Government Announcement Date	CPT Size	Chinese Industry-Average Production Cost	Average But-For Price of Flat CPTs Made in China 2001 Q1	But-For Price Below Chinese Industry-Average Production Cost?
9/13/2000	21-inch regular flat	$49.52	$77.83	No
9/13/2000	29-inch ultra flat	$137.08	$185.76	No

Ms. Guerin-Calvert also compares an implied but-for price for 21-inch CPTs to the industry average cost for 1999 Q2. The industry average cost does not specify whether the cost is for round, flat, or both CPTs. Some of the price data indicate 21-inch CPTs in that quarter are for round screens, but often do not indicate round or flat. That the implied non-Irico but-for price in

[40] See 1998 Notice, Article 5 in Clarke Report, Appendix 2 and April 1999 Notice, Article 4 in Clarke Report, Appendix 5.

[41] Clarke Report, Appendix 9. Specifically, the costs for the 21-inch CPT is for regular flat screens and for 29-inch CPT is for ultra-flat screens.

[42] United States International Trade Commission, May 2004, Certain Color Television Receivers from China, USITC Publication 3695, http://www.usitc.gov/publications/701_731/pub3695.pdf, accessed 17 May 2012, at I-7.

this quarter is below the industry average production cost is therefore ambiguous and may be an artifact of comparing prices and costs for different products, flat and round CPTs.

In sum, of the three quarter/size combinations for which Ms. Guerin-Calvert compares non-Irico but-for prices implied by my model to the industry-average CPT production cost published by the Chinese government, two contradict her own argument and the remaining one is ambiguous and does not clearly support her conclusion.

D. Ms. Guerin-Calvert makes sweeping generalizations based on an erroneous analysis of 0.2% of the damages model data

Ms. Guerin-Calvert compares three but-for prices to industry average production costs.[43] As I show above, two of these comparisons are flatly incorrect and do not support her conclusion; the remaining one is ambiguous and therefore also does not support her conclusion.

Even if all three comparisons did show but-for prices that were below industry average production costs (which they do not), and even if industry average production costs were the proper price floor, these three observations represent a miniscule share of the 850 size/quarter combinations of CPTs manufactured during the damages period or even of the 279 size/quarter combinations of CPTs manufactured in China during the damages period. In addition, neither Ms. Guerin-Calvert nor Professor Clarke make any claims regarding the existence of a Chinese price floor corresponding to the other 276 size/quarter combinations for CPT products manufactured in China available in the data used by Ms. Guerin-Calvert in this analysis.

Of the total revenue I used for my overcharge regression, the price data used by Ms. Guerin-Calvert in these three comparisons involve only 0.2% of damages period revenue.

Thus, even if accurate, Ms. Guerin-Calvert's singular observation is not sufficient to conclude that my model is not an economically sound basis for the calculation of classwide damages.

E. Summary

Even if Ms. Guerin-Calvert is using the correct price floor, her comparisons do not use Irico prices, do not use correct prices, and represent a miniscule amount of the revenue of CPTs manufactured during the damages period (even if limited to CPTs manufactured in China). It therefore remains my opinion that my damages model is an economically sound basis for my calculation of classwide damages.

V. The assumption that horizontal communications relating to CPTs were not directed at North American customers does not change the evidence that the cartel raised prices of CPTs purchased in North America

Ms. Guerin-Calvert was "asked to assume that the horizontal communications relating to CPTs in which Irico allegedly engaged were not directed at North American CPT customers."[44] She then concludes that "evidence that the North American CPT market differed materially from the

[43] The Pricing Documents have industry average costs for five size-quarters; two of those costs are for 25-inch CPTs. There are no 25-inch CPTs manufactured in China for those quarters in the data, so there are no prices to compare to the industry average costs.

[44] Guerin-Calvert Supplemental Report, ¶34.

rest of the world" and economic analyses "from previous reports" implies my damages model "does not reliably reflect the impact on IPPs of this conduct."[45]

The primary basis for Ms. Guerin-Calvert's claims is Professor Willig's August 5, 2014 Expert Report, which Ms. Guerin-Calvert references as the "Willig Report." In particular, of her seven cites to Professor Willig to support her claim, six of them are to the Willig Report.[46] I explained in my September 26, 2014 Rebuttal Expert Report why Professor Willig's claims do not change my direct overcharge conclusions. Specifically, I demonstrated that Professor Willig's flawed arguments failed to rebut my conclusion that applying economic principles to the cartel's conduct, together with econometric analyses of the empirical evidence, shows that the cartel did increase prices for CPTs purchased in North America.[47] I summarize below the rebuttal laid out in my Rebuttal Report.

A. The evidence supports the existence of a global cartel, impacting prices globally, including in North America

I presented economic evidence in my Expert Report that the cartel's price-fixing impacted the U.S.[48] Further, in my Expert Rebuttal Report I explained that Defendants' experts' arguments that the cartel's conspiracy to raise CPTs prices did not impact the U.S., or that the impact in the U.S. was different than the impact elsewhere, ignored or inappropriately dismissed the economic evidence and analyses in my Expert Report, namely: [49]

- Defendants held numerous cartel meetings and information exchanges in North America, which would be expected to affect CPTs made and sold in North America. For example, Samsung explained that it was "meeting with North American businesses in order to find a cooperation plan related to areas of common interest, and secure communication channels to continuously maintain such relationship" and indicated Samsung's "North American market strategy [includes c]ontinuous maintenance of mutual cooperation within market."[50]
- Defendants' experts' exhibits show nearly one third of all CRT TVs imported into America were from Asia and that this share increased steadily over time, with imports from Asia accounting for over 60% of CRT TVs shipped to the U.S. in 2002 and over 80% in 2006.[51] This further confirms my conclusions that the cartel impacted sales in the United States.

[45] Guerin-Calvert Supplemental Report, ¶34.

[46] The seventh is a cite to Professor Willig's Surrebuttal Report, ¶32.

[47] Netz Expert Rebuttal Report, pp. 32-47.

[48] Netz Expert Report, Section VIII.A.5, The cartel's price-fixing impacted the U.S.

[49] Netz Expert Rebuttal Report, pp. 33-34.

[50] Im, Chul Hong, 12 January 1999, North America CPT companies meeting summary, SDCRT-0002526 -SDCRT-0002528, at 2526E and 2527E.

[51] 05 August 2014, Opposition Expert Report of Lawrence Wu, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division), ¶70 and Exhibit 8.

- Defendants sold a significant number of CRTs to purchasers in the U.S. The available Defendant sales data indicate that at least $1.028 billion of CDTs and $13.18 billion of CPTs were shipped or billed to customers in the U.S. or Mexico in the years 1995-2007.[52] Of that total, at least $0.6 billion of CDTs and $8.6 billion of CPTs were shipped or billed to U.S. customers in the years 1995-2007.[53] These figures understate the true value of shipments to U.S. customers because I do not have complete sales data for some Defendants and some Defendants' data do not include customer location information.
- Defendants' North American collusion was intertwined with collusive activities in Asia. For example, a meeting summary explains that, "Based on December meeting at headquarters, there was a subsequent meeting for purposes of finding grounds for cooperation within the North American market…"[54] Similarly, an LPD internal e-mail about a meeting among LPD, Samsung, and Toshiba concludes "Dear AM [Americas] and EU colleague, Please let me know if there is anything we have to talk with SDI and Toshiba at global level. We will get together comming [sic] July in Japan. And I can keep in touch with them from time to time by mail or phone."[55]
- There is significant evidence that many Defendants' headquarters influenced, and even set, the prices at which their North American and other subsidiaries sold CPTs to customers. For example, in my Expert Report, I provide evidence that pricing decisions at Chunghwa's subsidiaries were controlled by headquarters in Taiwan (specifically, by C.C. Liu) for its sales to North America and other regions;[56] LG's headquarters provided price guidelines for its North American and other regional subsidiaries;[57] pricing at MTPD's North American and other regional subsidiaries was done according to business plans created by top management at headquarters;[58] and Philips had "Commercial Council Meetings" of regional CPT marketing and sales managers to discuss, among other things, pricing policies in North America and other regions.[59]

This evidence all supports my conclusion that the cartel intended to and was operated to raise the prices of CRTs globally, including those consumed in North America, including the United States.

[52] See "us_sales.txt" from my Expert Rebuttal Report backup for calculations.

[53] See "us_sales.txt" from my Expert Rebuttal Report backup for calculations.

[54] Im, Chul Hong, 12 January 1999, North America CPT companies meeting summary, SDCRT-0002526 - SDCRT-0002528, at 2527E, emphasis added.

[55] Philips, Lee, Phil PJ, 30 May 2002, E-mail, Subject: Information for SDI and Toshiba, PHLP-CRT-014272 - PHLP-CRT-014274, at 4273.

[56] Netz Expert Report, footnote 237.

[57] Netz Expert Report, footnote 238.

[58] Netz Expert Report, footnote 240.

[59] Netz Expert Report, footnote 242.

B. The evidence shows that the cartel's target prices increased prices to North American purchasers

Defendants used a variety of tools, including agreements to set target prices for specific CRT types, restrict output, reduce capacity, allocate customers, and exchange sensitive information on price and market conditions.[60] Despite participants' incentives to cover up collusive activity, I was able to identify target prices for approximately 29.7% of all CPTs and 13.3% of large CPTs.[61]

I showed in my previous reports that the target prices Defendants' set during cartel meetings exhibit an economically meaningful and statistically significant impact on the prices paid by North American direct purchasers. In particular, I demonstrated in my Rebuttal Report that:[62]

- Defendants' target prices[63] exhibit an economically meaningful and statistically significant impact on the prices paid by North American direct purchasers.[64] These results are similar to the results of my regressions assessing the impact of target prices on worldwide CPT prices presented in my Expert Report.[65] In fact, the effect of target prices on the prices paid by North American purchasers is stronger than the effect on prices worldwide, as reflected in the larger coefficient estimate in the regression on North American sales.
- I performed an additional empirical analysis that confirms that the cartel's target prices impacted sales to North American purchasers. Specifically, I performed a regression analysis that estimates the effect of an index[66] of target prices on the level of actual prices paid by North American purchasers for CPTs that I was unable to match to a specific target price.[67] The index of Defendants' target prices exhibits an economically meaningful and statistically significant impact on the prices paid by North American direct purchasers for CRTs that I was unable to match to a specific target price. These results are also similar to the results of regressions assessing the impact on worldwide

[60] Netz Expert Report, Section VIII.A.5, The cartel's price-fixing impacted the U.S.

[61] Netz Expert Report, p. 63 and combine_target_defendant_large_cpt.log in my Expert Rebuttal Report backup files.

[62] Netz Expert Rebuttal Report, p. 49.

[63] The cartel set "target" prices for specific CRTs types and time periods. I was able to compile these targets. In some cases, I could match target prices with the prices of the same CRT type. In other cases, I did not identify a target price for a particular CRT type and time period that appeared in the transaction data. See Netz Expert Rebuttal Report, p. 49.

[64] Professor Willig claimed the contrary. His regression analysis was subject to errors. Specifically, he ran his regressions using price changes instead of price levels. Defendants set target and actual prices in dollar levels, hence, testing whether their target-price conduct affected actual prices should be done using levels. Correcting this error reverses his findings.

[65] Netz Expert Report, Section VIII.A.4.a and Exhibit 38.

[66] I used a Fisher price index, which is a method of calculating average prices that accounts for changes in the composition of target prices over time.

[67] Netz Expert Rebuttal Report, Exhibit RR-97.

CPT prices that I presented in my Expert Report.[68] The effect of the target price index on actual prices paid by North American purchasers is stronger than the effect on prices worldwide, as reflected in the larger coefficient estimate in the regression on North American sales.

Together, these results indicate that the cartel effectively raised prices to all North American purchasers, regardless of whether there is a record of Defendants setting target prices for a particular sale.

C. The evidence shows that the cartel overcharge applied to North American purchasers

Ms. Guerin-Calvert relies on analyses "from previous reports" as a basis for her contention that "the fact that horizontal communications relating to CPTs in which Irico allegedly engaged were not directed at North American CPT customers implies that [Dr. Netz's] model does not reliably reflect the impact on IPPs on this conduct."[69]

In my Rebuttal Report, I responded to Professor Willig's (and other Defendants' experts' similar) arguments that the cartel's collusive actions did not have an impact on prices in North America, or that the impact there differed from the impact in other parts of the world.[70] With regards to the empirical analyses Ms. Guerin-Calvert cites, I previously explained:[71]

- Professor Willig attempted an empirical analysis of the impact to purchasers located in North America.[72] He identified Defendants' sales to North American purchasers and used these data to generate an estimate of the cartel overcharge specific to North American purchasers.[73] Professor Willig's estimate of the overcharge indicates that North American prices were, on average, 5.14% higher during the cartel period than they would have been in the but-for world.[74] By itself, Professor Willig's estimate is evidence that Defendants' conduct had an impact on North American purchasers. My estimates of the worldwide CPT overcharge are based on significantly more data, which means they are more reliable

[68] Netz Expert Report, Section VIII.A.4.b.3 and Exhibit 45.

[69] Guerin-Calvert Supplemental Report, ¶34.

[70] See, e.g.,

- Rubinfeld Opposition Report, ¶¶67-90.
- Williams Opposition Report, ¶¶28-36, 41, 47-54, 140-143.
- Willig Opposition Report, ¶¶96-98.
- Wu Opposition Report, ¶¶67-84.

[71] Netz Expert Rebuttal Report, p. 63.

[72] Willig Opposition Report, ¶98.

[73] Willig Opposition Report, ¶98.

[74] Willig Opposition Report, ¶98.

and precise than Professor Willig's estimates of the overcharge paid by North American purchasers.[75]

Irico counsel's assumption "that the horizontal communications relating to CPTs in which Irico allegedly engaged were not directed at North American CPT customers"[76] does not change my conclusions, which are based on the case evidence and reliable economic principles and analyses.

VI. The economic evidence supports my previous economic conclusions, including for Irico

None of the rebuttal arguments I made regarding North American CPTs are defendant specific. That is, my rebuttal arguments all apply equally to Irico as to other Defendants. Further, while Irico's counsel's assumptions about whether certain legal conclusions are obtained are outside of my expertise, my damages results can accommodate any such legal conclusions through simple arithmetic adjustments.

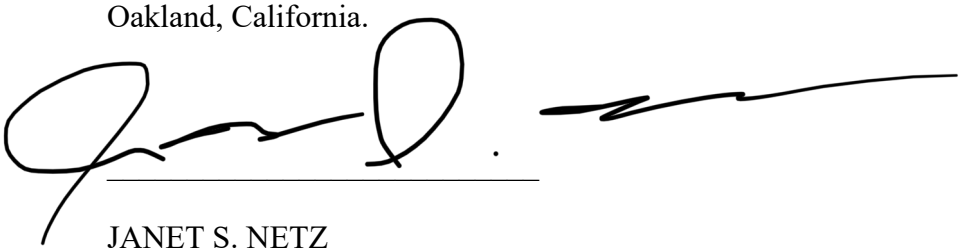
Consequently, I maintain, as I did in my September 26, 2014 Rebuttal Expert Report, that my conclusion that 22.0% and 9.0% are reasonable measures of the direct overcharge the cartel participants imposed on CDTs and CPTs, respectively, for most of the cartel period.[77]

[75] My worldwide overcharge estimates incorporate data from all sources while Professor Willig is forced to discard a substantial amount of data from his NAFTA overcharge estimates because the data have incomplete customer location information. As a result, my worldwide CPT overcharge estimates are based on 2,574 observations, while Professor Willig's NAFTA estimates are based on only 1,314 observations. My estimates are based on roughly twice as many data points as Professor Willig's.

[76] Guerin-Calvert Supplemental Report, ¶34.

[77] Netz Expert Report Errata.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief. This declaration was executed on the 27th day of April 2022, at Oakland, California.



JANET S. NETZ

applEcon
Credible. Concise. Clear.

Dr. Janet S. Netz

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Education

Ph.D. Economics, University of Michigan, 1992
M.A. Economics, University of Michigan, 1990
B.A. Economics, University of California at Berkeley, 1986, *cum laude*

Employment

Founder and Partner, applEcon, May 2001 to present
Visiting Associate Professor, University of Michigan, Fall 2001, Fall 2002, Fall 2003
Associate Professor, Purdue University, Fall 2001 to January 2003
Visiting Assistant Professor, University of Michigan, Winter 2001
Assistant Professor, Purdue University, Fall 1994 to Spring 2001
Assistant Professor, University of Delaware, Fall 1992 to Summer 1994

Courses Taught

Industrial Organization (undergraduate and doctoral)
Antitrust and Regulation (undergraduate)
Intermediate Microeconomics (undergraduate and master's)
Microeconomic Principles (undergraduate)
International Economics (undergraduate and master's)

Honors and Awards

Outstanding Antitrust Litigation Achievement in Economics, awarded by the American Antitrust Institute, for work In re TFT-LCD Antitrust Litigation, 2013.

Outstanding Economics Professor of the Year, Economics Club, Purdue University, 1999.

Publications

"Are All Men's College Basketball Players Exploited?", with Erin Lane and Juan Nagel, *Journal of Sports Economics*, 15(3), June 2014, 237-262.

"Price Regulation: Theory and Performance", in *Regulation and Economics*, Roger J. Van den Bergh and Alessio M. Pacces, eds., Edward Elgar Publishing, 2011.

"Sports Trivia: A Review of The Economics of Intercollegiate Sports by Randy R. Grant, John Leadley, and Zenon Zygmont", *Journal of Economic Literature*, 47(2), June 2009, 485-489.

"One-Way Standards as an Anti-Competitive Strategy", with Jeffrey K. MacKie-Mason, in *Standards and Public Policy*, Shane Greenstein and Victor Stango, eds., Cambridge Press, 2007.

"International Integration and Growth: A Further Investigation on Developing Countries", with Claire Economidou and Vivian Lei, *International Advances in Economic Research*, 12(4), November 2006, 435-448.

"Maximum or Minimum Differentiation? An Empirical Investigation into the Location of Firms", with Beck A. Taylor, *Review of Economics and Statistics*, 84(1), February 2002, 162-175.

"International Integration and Growth: A Survey and Empirical Investigation", with Vivian Lei and Jon D. Haveman, *Review of Development Economics*, 5(2), June 2001, 289-311.

"Price Regulation: A (Non-Technical) Overview", in *Encyclopedia of Law and Economics*, Boudewijn Bouckaert and Gerrit De Geest, eds, Edward Elgar and University of Ghent, 2000.

"Exercising Market Power in Proprietary Aftermarkets," with Severin Borenstein and Jeffrey K. MacKie-Mason, *Journal of Economic and Management Strategy*, 9(2), Summer 2000, 157-188.

"All in the Family: Family, Income, and Labor Force Attachment", with Jon D. Haveman, *Feminist Economics*, 5(3), November 1999, 85-106.

"Why Do All Flights Leave at 8am?: Competition and Departure-Time Differentiation in Airline Markets", with Severin Borenstein, *International Journal of Industrial Organization*, 17(5), July 1999, 611-640.

"An Empirical Test of the Effect of Basis Risk on Cash Market Positions", *Journal of Futures Markets*, 16(3), May 1996, 289-312.

"The Effect of Futures Markets and Corners on Storage and Spot Price Variability", *American Journal of Agricultural Economics*, 77(1), February 1995, 182-193.

"Antitrust Policy in Aftermarkets", with Severin Borenstein and Jeffrey K. MacKie-Mason, *Antitrust Law Journal*, 63(2), Winter 1995, 455-482.

"The Economics of Customer Lock-In and Market Power in Services", with Severin Borenstein and Jeffrey K. MacKie-Mason, in *The Service Productivity and Quality Challenge*, Patrick T. Harker, ed., Kluwer Academic, 1994.

Working Papers and Work in Progress

"LCDs and Antitrust: Does Crime Pay?", with Nick Navitski and Josh Palmer

"Fantasy Football Points as a Measure of Performance", with Erin Lane and Juan Nagel

"Non-Profits and Price-Fixing: The Case of the Ivy League"

"The End of Collusion? Competition after Justice and the Ivy League and MIT Settle"

"Basis and Exchange Rate Risks and their Impact on Storage and Exports"

Research Grants

"Product Customization and Product-Space Positioning", Dauch Center for the Management of Manufacturing Enterprises, Summer 2000.

"Trade Barriers, Trade Blocs, Growth, and Convergence", Purdue Research Foundation, 1998-1999.
"Effects of Informational Asymmetry on Competition in the Residential Long Distance Calling Market", Purdue Research Foundation, 1997-1998.

"Basis and Exchange Rate Risks and their Impact on Storage and Exports", Center for International Business and Economic Research, Summer 1997.

Global Initiative Faculty Grant (Course Development), "Industrial Organization in an International Marketplace", Purdue University, Summer 1997.

"Trade, Not Aid", Purdue Research Foundation, Summer 1996.

"Trade, Not Aid", Center for International Business and Economic Research, Summer 1996.

"The Effect of Price-Fixing by Institutions of Higher Education", Purdue Research Foundation, Summer 1995.

"Applied Microeconomics/International Workshop", Purdue University, Spring 1995.

"The Market Structure of Higher Education", University of Delaware, Summer 1993.

Research Associate, Center for the Study of Futures Markets, Columbia University, 1991.

Rackham Merit Fellowship, University of Michigan, 1987-1989.

Chancellor's Scholar, University of California at Berkeley, 1983-1986.

Referee

American Economic Review
Contemporary Economic Policy
Economics Bulletin
Feminist Economics
International Journal of the Economics of Business
International Journal of Industrial Organization
Journal of Economic Education
Journal of Economic and Management Strategy
Journal of Family and Economic Issues
Journal of Futures Markets
Journal of Industrial Economics
Journal of Law and Economics
Journal of Law, Economics, and Organization
Management Science
Review of Economics and Statistics
Scandinavian Journal of Economics

Telecommunications Systems

Conference and Workshop Presentations

Panel participant, "*Apple v. Pepper*: SCOTUS Clarifies Application of *Illinois Brick*", ABA Section of Antitrust Law, May 2019.

Panel participant, "Is 'Direct' Really Correct? Bricks, Tix, Kicks, and Apps after Apple v. Pepper", ABA Section of Antitrust Law, Pricing Conduct and Civil Practice and Procedure Committees Program, October 2018.

Panel participant, "Will Apple's App Store Lead to the end of Illinois Brick", CLA Antitrust, UCL & Privacy Law Section and ABA Antitrust Section's Global Private Litigation Committee program, San Francisco, CA, July 2018.

Guest lecturer, Antitrust Law, University of San Francisco Law School, April 2017 and 2018.

Panel participant, "The Challenge of Circumstantial Proof of Cartel Behavior and of Presenting Economic Issues and Concepts to Judges and Juries", American Antitrust Institute, 10th Annual Private Enforcement Conference, Washington, DC, November 2016.

Panel participant, "Winning or Losing: Class Certification Post-Comcast", American Bar Association, 62nd Antitrust Law Spring Meeting, Washington, DC, March 2014.

Panel participant, "Preparing Early and Often", State-of-the-Art Strategies for Managing Class Action Experts, American Bar Association, 16th Annual National Institute on Class Actions, Chicago, IL, October 2012.

Panel participant, "Hot Topics Involving Experts in Antitrust Litigation", New York State Bar Association, Antitrust Law Section, Annual Meeting, New York, NY, January 2011.

Guest lecturer, Alternative Dispute Resolution Practicum, University of Michigan Law School, April 2008.

"The Economics of Indirect Purchaser Cases", State Bar of Arizona Annual Conference, Phoenix, AZ, June 2004.

"Manipulating Interface Standards as an Anti-Competitive Strategy", Standards and Public Policy Conference, Federal Reserve Bank of Chicago, Chicago, Il, May 2004.

"One-Way Standards as an Anti-Competitive Strategy", Telecommunications Policy Research Conference, Alexandria, VA, September 2002.

"Product Proliferation and Product Space Location", Econometric Society Meetings, New Orleans, January 2001.

"The End of Collusion? Competition after Justice and the Ivy League and MIT Settle", American Economics Association Meetings, New Orleans, January 2001.

"The End of Collusion? Competition after Justice and the Ivy League and MIT Settle", Indiana University-Purdue University Indianapolis, November 2000.

"Maximum or Minimum Differentiation? An Empirical Investigation into the Location of Firms", University of British Columbia, March 2000.

"Non-Profits and Price-Fixing: The Case of the Ivy League", University of Illinois, October 1999.

"The End of Collusion? Competition after Justice and the Ivy League and MIT Settle", Baylor University, September 1999.

"The End of Collusion? Competition after Justice and the Ivy League and MIT Settle", Western Economic Association Meetings, San Diego, July 1999.

"Non-Profits and Price-Fixing: The Case of the Ivy League", University of Chicago, April 1999.

"Non-Profits and Price-Fixing: The Case of the Ivy League", Indiana University, December 1998.

"International Integration and Growth: A Survey and Empirical Investigation", Dynamics, Economic Growth, and International Trade, III, Taiwan, August 1998.

Discussant ("Fiscal Policy and International Demand Spillovers"), Dynamics, Economic Growth, and International Trade, III, An International Conference, Taiwan, August 1998.

"International Integration and Growth", Workshop on Empirical Research in International Trade and Investment, Copenhagen, June 1998.

Discussant ("Factor Endowments and the Pattern of Affiliate Production by Multinational Enterprises," by Karolina Ekholm), Workshop on Empirical Research in International Trade and Investment, Copenhagen, June 1998.

"Non-Profits and Price-Fixing: The Case of the Ivy League", Department of Justice Antitrust Division, April 1998.

"Non-Profits and Price-Fixing: The Case of the Ivy League", American Economics Association Meetings, Chicago, January 1998.

Discussant ("Equilibrium under Satisficing," by Ralph W. Pfouts), International Atlantic Economics Society, ASSA Meetings, Chicago, January 1998.

Discussant ("Overseas Investments and Firm Exports," by Keith Head and John Ries), Fourth Annual Empirical Investigations in International Trade conference, Purdue University, November 1997.

"Maximum or Minimum Differentiation? An Empirical Investigation into the Location of Firms", International Atlantic Economic Association Conference, Philadelphia, October 1997.

Discussant ("Antidumping Enforcement in a Reciprocal Model of Dumping: Theory and Evidence," Taiji Furusawa and Thomas J. Prusa) and session chair, Third Annual Empirical Investigations in International Trade conference, Purdue University, November 1996.

"The Effect of Price-Fixing by Institutions of Higher Education", Indiana University-Purdue University Indianapolis, April 1996.

"Exercising Market Power in Proprietary Aftermarkets", with Severin Borenstein and Jeffrey K. MacKie-Mason, Indiana University - Purdue University - IUPUI First Tri-School Conference, March 1996.

"All in the Family: Family, Income, and Labor Force Attachment", with Jon D. Haveman, American Economic Association Meetings, San Francisco, January 1996.

"Family Matters: Unemployment, Wage Changes, and Mobility", with Jon D. Haveman, Southern Economics Association Meetings, New Orleans, November 1995.

Discussant and session chair, Second Annual Empirical Investigations in International Trade conference, Purdue University, November 1995.

"Competition and Anti-Competitive Behavior", ICLE (The State Bar of Michigan) Conference on Antitrust and Intellectual Property, July 1995.

"Price-Fixing, Tuition, and Financial Aid", Midwest Economics Association Meetings, Cincinnati, April 1995.

"Family Matters: Unemployment, Wage Changes, and Mobility," Midwest Economics Association Meetings, Cincinnati, April 1995.

Discussant and session chair, "Customer Discrimination, Entrepreneurial Decisions, and Investment", Midwest Economics Association Meetings, April 1995.

"An Empirical Test of the Effect of Basis Risk on Cash Market Positions", University of Illinois, Urbana-Champaign, February 1995.

Discussant and session chair, First Annual Empirical Investigations in International Trade conference, Purdue University, November 1994.

"Antitrust Policy in Aftermarkets", with Severin Borenstein and Jeffrey K. MacKie-Mason, FTC/DOJ/ABA Conference on Post-Chicago Economics, Washington, D.C., May 1994.

"The Effect of Price-Fixing by Institutions of Higher Education, University of Delaware, May 1994.

"The Effect of Futures Markets and Corners on Storage and Spot Price Variability", Purdue University, February 1994.

"An Empirical Test of the Effect of Basis Risk on Cash Market Positions", University of California at Davis, February 1993.

Discussant, Econometrics Association, Anaheim, 1992 Annual Meetings.

"Testing the Principle of Minimum Differentiation: Airline Departure-Time Crowding", Econometrics Association, Washington, D.C., 1990 Annual Meetings.

Consulting and Testifying

Automobile Antitrust Cases I and II, 2021-
Superior Court of California County of San Francisco Unlimited Jurisdiction, Case No. CJC-03-004298 and CJC-03-004303
Testifying expert for plaintiffs
Deposed September 2021

Contant v. Bank of America, 2019-
United States District Court, Southern District of New York, No. 17-cv-3139-LGS
Testifying expert for plaintiffs

Barroqueiro, et al. v. Qualcomm Incorporated, et al., 2019-
Supreme Court of British Columbia, VLC-S-S1410987
Antitrust analysis regarding various cellular phone components

Confidential client, 2018-
Antitrust analysis regarding pharmaceutical products

In re Malden Transportation, Inc. et al., v. Uber Technologies, Inc., 2018-
United States District Court, District of Massachusetts, No. 1:16-cv-12538-NGM
Testifying expert for plaintiffs

Confidential client, 2017-2018
Antitrust analysis regarding various cellular phone components

In re Automotive Parts Antitrust Litigation
United States District Court, Eastern District of Michigan Southern Division, No. 2:12-cv-02311
Testifying expert for plaintiffs

- In re Occupant Safety Systems, No. 2:12-cv-00603, 2018-
- In re Heater Control Panels, No. 2:12-cv-00403, 2018-
- In re Anti-Vibrational Rubber Parts, No. 2:13-cv-00803-MOB-MKM, 2016-
- In re Bearings, No. 2:12-cv-00500, 2016-
- In re Automotive Wire Harness Systems Antitrust Litigation, No.12-md-00101, 2012-
- In re Shock Absorbers Cases, No. 2:16-cv-0332, 2015-

Alarm Detection Systems, Inc. v. Orland Fire Protection District, et al., 2016-2019
United States District Court, Northern District of Illinois, No. 14-cv-00876
Testifying expert for plaintiff
Deposed May 2017
Testified at trial May 2017

In re LIBOR-Based Financial Instruments Antitrust Litigation, 2016-
United States District Court, Southern District of New York, No. 1:11-md-02262-NRB
Testifying expert for plaintiffs
Deposed March 2017, June 2017

Stacey Pierce-Nunes, on behalf of herself and all others similarly situated, v. Toshiba American Information Systems, 2015-
United States District Court, Central District of California, No. 3:14-CV-00796 JST
Testifying expert for plaintiffs
Deposed April 2016

John Moseley v. Toshiba America Information Systems, Inc., 2015-
Judicial Arbitration and Mediation Services No. 1200049482
Testifying expert for claimant
Deposed July 2015

In re Cathode Ray Tube (CRT) Antitrust Litigation, 2008-
United States District Court, Northern District of California, San Francisco Division, No. CV-07-5944-SC
Testifying expert for plaintiffs
Deposed November 2012, March 2013, June 2014, September 2014, October 2014

In re Photochromic Lens Antitrust Litigation, 2010-2012
United States District Court Middle District of Florida, Tampa Division, No. 8:10-md-02173-JDW-EAJ
Testifying expert for plaintiffs
Deposed August 2012

Datel Holdings and Datel Design and Development v. Microsoft, 2010-2011
United States District Court, Northern District of California, San Francisco Division, No. 09-cv-05535
Testifying expert for plaintiffs
Deposed October 2011

In re Prefilled Propane Tank Marketing and Sales Practices Litigation, 2010-2011
United States District Court, Western District of Missouri, Western Division, No. 4:09-cv-00465
Testifying expert for plaintiffs

In re Florida Cement and Concrete Antitrust Litigation, 2010
United States District Court, Southern District of Florida, Miami Division, No. 1:09-cv-23493-CMA
Consulting expert for plaintiffs

Altair Engineering v. MSC Software, 2009-2010
United States District Court, Eastern District of Michigan, Southern Division, No. 2:07-cv-12807
Testifying expert for plaintiff
Deposed May 2010

In re Optical Disk Drive products Antitrust Litigation, 2009-2010
United States District Court, Northern District of California, San Francisco Division, No. M:2010-cv-02143
Consulting expert for plaintiffs

In re Flash Memory Antitrust Litigation, 2008-2011
United States District Court, Northern District of California, Oakland Division, No. C-07-0086-SBA
Testifying expert for plaintiffs
Deposed August 2009

Valassis Communications, Inc. v. News America, Inc., 2008-2009
United States District Court, Eastern District of Michigan, Southern Division, No. 2:06-cv-10240
Circuit Court of the State of Michigan, County of Wayne, No. 07-0706645-CZ
Consulting expert for plaintiff

In re TFT-LCD (Flat Panel) Antitrust Litigation, 2008-2012
United States District Court, Northern District of California, San Francisco Division, No. M:07-cv-01827
Testifying expert for plaintiffs
Deposed July 2009, June 2011, August 2011

Houston Baptist University v. NCAA, 2008-2009
United States District Court in and for the Southern District of Texas, Houston Division
Testifying expert for plaintiff

Seoul Semiconductor Co. v. Nichia Corp., 2008
United States District Court, Northern District of California, No. 3:08-cv-04932-PJH
Testifying expert for plaintiffs

Albert Andy Cohn v. Office Depot, 2008
Superior Court of the State of California, County of Los Angeles, Central District, No. BC 372449
Testifying expert for defendant

In re Graphics Processing Units Antitrust Litigation, 2007-2008
United States District Court Northern District of California, No. M:07-CV-01826-WHA
Testifying expert for plaintiffs
Deposed June 2008

Pro-Sys Consultants Ltd. and Neil Godfrey v. Microsoft, 2007-2018
Supreme Court of British Columbia, No. L043175, Vancouver Registry
Testifying expert for plaintiffs
Deposed December 2008

In re Dynamic Random Access Memory (DRAM) Antitrust Litigation, 2007
United States District Court, Northern District of California, No. 02-cv-01486
Consulting expert for plaintiffs

Jason White et al. v. NCAA, 2006-2008
United States District Court Central District of California, No. CV 06-0999 RGK (MANx)
Testifying expert for plaintiffs
Deposed October 2007

In re Reformulated Gasoline (RFG) Antitrust and Patent Litigation, 2004-2008
United States District Court Central District of California, No. 05-1671 CAS
Testifying expert for plaintiffs
Deposed December 2006

Carlisle, settlement negotiations with Crompton, EPDM price-fixing cartel, 2005-2007
Consulting expert

Caterpillar and Carlisle, settlement negotiations with DuPont-Dow Elastomers, PCP (or CR) and EPDM price-fixing cartels, 2004-2005
Consulting expert

City and County of San Francisco et al. v. Microsoft, 2004-2007
United States District Court for the District of Maryland, No. 1332
Testifying expert for plaintiffs

The Service Source v. Office Depot, 2004-2005
United States District Court Eastern District of Michigan Southern Division, No. 02-73361
Project director

Joe Comes et al. v. Microsoft, 2002-2008
Iowa District Court for Polk County, No. CL82311
Testifying expert for plaintiffs
Deposed July 2006, November 2006

Charles Cox et al. v. Microsoft, 2002-2006
Supreme Court of the State of New York County of New York, No. 105193/00
Testifying expert for plaintiffs

Daniel Gordon et al. v. Microsoft, 2002-2004
State of Minnesota District Court County of Hennepin Fourth Judicial District, No. 00-5994
Testifying expert for plaintiffs
Deposed September 2003

Morelock Enterprises, Inc. v. Weyerhaeuser Co., 2004-2008
United States District Court District of Oregon, No. 3:04-cv-00583-PA
Testifying expert for plaintiffs
Deposed October 2004, April 2005, October 2007
Testified in trial April 2008

Compuware v. IBM, 2002-2005
United States District Court for the Eastern District of Michigan, No. 02-70906
Project director

In re New Mexico Indirect Purchaser Microsoft Corp. Antitrust Litigation, 2002-2004
State of New Mexico First Judicial District, No. D-0101-CV-2000-1697
Testifying expert for plaintiffs

Charles Friedman et al. v. Microsoft, 2002-2004
Superior Court of the State of Arizona in and for the County of Maricopa, No. CV2000-000722 / CV2000-005872
Testifying expert for plaintiffs
Deposed September 2003

In re Massachusetts Consumer Protection Litigation, 2003-2004
Commonwealth of Massachusetts, Superior Court Department of the Trial Court Middlesex Division, No. 00-2456
Consulting expert

Olson v. Microsoft, 2002
Montana First Judicial District Court Lewis & Clark County, No. CDV-2000-219
Consulting expert

Covad v. Bell Atlantic (Verizon), 2001-2004
United District Court for the District of Columbia, No. 99-1046
Project director

AMD, 2000-2004
Project director

Leckrone, et al. v. Premark International, Inc., et al., 2001
Testifying expert for plaintiffs

Ren, et al. v. EMI Music Distribution, Inc., 2001
State of Michigan in the Circuit Court of the County of Macomb, No. 00-2383-CZ
Testifying expert for plaintiffs

SBC, 2000
Staff economist

Lingo et al. v. Microsoft, 1999-2004
Superior Court of the State of California City and County of San Francisco, J.C.C.P. No. 4106
Project director

Gravity et al. v. Microsoft, 1999-2003
United States District Court for the District of Columbia, No. 1:99CV00363
Staff economist

City and County of San Francisco, 1999
Staff economist

Intergraph v. Intel, 1998-2001
United States District Court Appeals for the Federal District, No. 98-1308
Staff economist

Comm-Tract v. Northern Telecom, 1991-1997
United States District Court District of Massachusetts, No. 90-13088-WF
Project director

Systemcare, Inc. v. Wang Computer, 1991-1993
United States District Court for the District of Colorado, No. 89-B-1778
Staff economist

International Travel Arrangers v. Northwest Airlines, 1988-1989
Staff economist

Exhibit B: Documents Relied Upon in Janet S. Netz, Ph. D.
Rebuttal to Supplemental Expert Report of Margaret E. Guerin-Calvert
Part 1: Bates Numbered Documents

CHU00030663

MTPD-0122906

PHLP-CRT-014274

SDCRT-0002528

All materials cited in the report, appendices, or backup files to the Netz Class Cert Declaration, Netz Class Cert Rebuttal, Netz Expert Report, or Netz Expert Rebuttal Report or their errata.

Exhibit B: Documents Relied Upon in Janet S. Netz, Ph. D.
Rebuttal to Supplemental Expert Report of Margaret E. Guerin-Calvert
Part 2: Confidential Documents without Bates Numbers

05 August 2014, Opposition Expert Report of Lawrence Wu, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

Clarke, Donald, 16 March 2022, Expert Report of Donald Clarke, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

Guerin-Calvert, Margaret E., 06 November 2014, Expert Surrebuttal Report of Margaret E. Guerin-Calvert, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

Guerin-Calvert, Margaret E., 16 March 2022, Supplemental Expert Report of Margaret E. Guerin-Calvert, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

Guerin-Calvert, Margaret E., 21 March 2022, Errata to the Supplemental Expert Report of Margaret E. Guerin-Calvert, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

Guerin-Calvert, Margaret E., 23 September 2014, Errata to The Expert Report of Margaret E. Guerin-Calvert, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

Guerin-Calvert, Margaret E., 05 August 2014, Expert Report of Margaret E. Guerin-Calvert, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

Netz, Janet S., 01 October 2012, Declaration of Janet S. Netz, Ph.D., In Support of Motion of Indirect-Purchaser Plaintiffs for Class Certification, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

Netz, Janet S., 03 July 2014, Errata to the Expert Report of Janet S. Netz, Ph.D., In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

Netz, Janet S., 15 April 2014, Expert Report of Janet S. Netz, PH.D, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

Netz, Janet S., 15 February 2013, Rebuttal Declaration of Janet S. Netz, PH.D., in Support of Motion of Indirect-Purchaser Plaintiffs for Class Certification, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

Netz, Janet S., 26 September 2014, Rebuttal Expert Report of Janet S. Netz, PH.D., In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

Willig, Robert D., 05 August 2014, Expert Report of Robert D. Willig, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

Willig, Robert D., 06 November 2014, Expert Surrebuttal Report of Robert D. Willig, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

All materials cited in the report, appendices, or backup files to the Netz Class Cert Declaration, Netz Class Cert Rebuttal, Netz Expert Report, or Netz Expert Rebuttal Report or their errata.

Exhibit C: Documents Relied Upon in Janet S. Netz, Ph. D. Rebuttal to Supplemental Expert Report of Margaret E. Guerin-Calvert

23 February 2022, Indirect Purchaser Plaintiffs' Objections and Responses to the IRICO Defendants' Second Set of Interrogatories, In re: Cathode Ray Tube (CRT) Antitrust Litigation (United States District Court Northern District of California San Francisco Division).

United States International Trade Commission, May 2004, Certain Color Television Receivers from China, USITC Publication 3695, http://www.USITC.gov/publications/701_731/pub3695.pdf, accessed 17 May 2012.

All materials cited in the report, appendices, or backup files to the Netz Class Cert Declaration, Netz Class Cert Rebuttal, Netz Expert Report, or Netz Expert Rebuttal Report or their errata.

EXHIBIT 10

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
OAKLAND DIVISION

IN RE: CATHODE RAY TUBE (CRT) ANTITRUST LITIGATION	) MASTER FILE NO.) CV-07-5944 JST
THIS DOCUMENT RELATES TO:	)
ALL INDIRECT PURCHASER ACTIONS ALL DIRECT PURCHASER ACTIONS	))
DEFENDANTS.	)

VIDEOTAPED DEPOSITION OF WANG ZHAOJIE

VOLUME III

THURSDAY, SEPTEMBER 22, 2022

MACAU S.A.R., CHINA

FILE NO. SF 5436468

REPORTED BY MARK McCLURE, CRR
CAL CSR 12203

VIDEOTAPED DEPOSITION OF WANG ZHAOJIE, VOLUME III, TAKEN AT 8:04 A.M., CHINA STANDARD TIME, THURSDAY, SEPTEMBER 22, 2022, MACAU, VIA VERITEXT REMOTE TECHNOLOGY, BEFORE MARK McCLURE, C.S.R. #12203, CERTIFIED SHORTHAND REPORTER IN AND FOR THE STATE OF CALIFORNIA.

APPEARANCES OF COUNSEL:

FOR THE PLAINTIFF, ALL INDIRECT PURCHASER:

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plaintiff's counsels are very loud in making the objections and that kind of interfered with my train of thought when I was formulating my responses. 17:32:20 17:32:24 17:32:28

I need a five-minute break, please. 17:32:32

MR. TALADAY: Okay. Let's go off the record, and we can resume in five minutes. 17:32:35 17:32:37

THE VIDEOGRAPHER: We are off the record at 8:32 a.m. 17:32:48 17:32:51

(A short recess was taken.) 17:33:51

THE VIDEOGRAPHER: We are back on the record at 8:40 a.m. 17:40:07 17:40:12

BY MR. TALADAY: 17:40:13

Q. Mr. Wang, my question is whether you believe that you became aware of these regulations at the time they were issued or near the time they were issued. 17:40:16 17:40:18 17:40:23

MR. RUSHING: Objection to the form. Mischaracterizes the exhibit. Lack of foundation. 17:40:40 17:40:44

THE WITNESS: The answer is yes. 17:40:55

BY MR. TALADAY: 17:40:55

Q. I believe you said that this regulation had an effect in the industry, is that correct? 17:40:58 17:41:04

MR. RUSHING: Objection to the form. 17:41:06

THE WITNESS: Yes. 17:41:20

BY MR. TALADAY: 17:41:21

Q. Can you tell us what effect it had? 17:41:22

MR. RUSHING: Object to form. Lack of foundation. 17:41:25 17:41:32

THE WITNESS: First of all, IRICO was and is a state-owned enterprise, and in the past, it was under the management and supervision of the department of electronics industry. Later on, it was transferred and put under the management and supervision of the state's department of information industry, so documents and regulations pertaining to the management of the state-owned enterprises would be related to IRICO, since it is a state-owned and state-managed enterprise, and IRICO has to adhere to the regulations and contents set forth in the documents, as well as the spirit described in the documents, because it is under the supervision and oversee of the council, and committees of the relevant industry from the country's departments. 17:42:09 17:42:12 17:42:16 17:42:24 17:42:26 17:42:31 17:42:38 17:42:42 17:42:45 17:42:51 17:42:57 17:43:00 17:43:05 17:43:13

BY MR. TALADAY: 17:43:13

Q. And when you say -- 17:43:21

MR. RUSHING: Move to strike as nonresponsive. 17:43:23

BY MR. TALADAY: 17:43:23

Q. When you say that IRICO had to adhere to the regulations and contents set forth in the documents, what was your understanding of the regulation and content set forth in the documents? 17:43:32 17:43:40 17:43:44 17:43:48

MR. RUSHING: Objection. Mischaracterizes the 17:43:50

EXHIBIT 11

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
OAKLAND DIVISION

IN RE: CATHODE RAY TUBE (CRT) ANTITRUST LITIGATION	) MASTER FILE NO.) CV-07-5944 JST
THIS DOCUMENT RELATES TO:	)
ALL INDIRECT PURCHASER ACTIONS ALL DIRECT PURCHASER ACTIONS	)
DEFENDANTS.	)

VIDEOTAPED DEPOSITION OF YAN YUNLONG
VOLUME III
THURSDAY, SEPTEMBER 29, 2022
MACAU S.A.R., CHINA

FILE NO. SF 5436477

REPORTED BY MARK McCLURE, CRR
CAL CSR 12203

VIDEOTAPED DEPOSITION OF YAN YUNLONG, VOLUME III, TAKEN AT 8:04 A.M., CHINA STANDARD TIME, THURSDAY, SEPTEMBER 29, 2022, MACAU S.A.R, CHINA, VIA VERITEXT REMOTE TECHNOLOGY, BEFORE MARK McCLURE, C.S.R. #12203, CERTIFIED SHORTHAND REPORTER IN AND FOR THE STATE OF CALIFORNIA.

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TERRY WEISS, VIDEOGRAPHER

competition by offering products at very low prices or prices that have gone beyond the cost. 08:53:47 08:53:52

MR. BIRKHAEUSER: Objection to the extent it calls for a legal opinion. 08:53:56 08:53:58

BY MR. CARTER: 08:53:58

Q. To your knowledge, would those laws and regulations have applied just to Irico or to all or some other scope of companies? 08:54:13 08:54:14 08:54:19

MR. RUSHING: Object to form. Objection that it calls for a legal opinion. Lacks foundation. 08:54:22 08:54:26

THE WITNESS: We can actually look up these laws and regulations, and they provide very clear scope and definition as to what industry it would be applied to. 08:55:35 08:55:37 08:55:41 08:55:46

And regarding the first law I referenced in my previous answer, I believe and I remember it could be applied to certain industries such as color picture tube, iron and maybe glass. 08:55:48 08:55:52 08:55:57 08:56:02

Regarding the second law I referenced, I remember it applies to the industry of color picture tubes and the TV sets that were manufactured by using color picture tubes, meaning the industry of TV sets that use color picture tubes. 08:56:06 08:56:13 08:56:15 08:56:21 08:56:26

BY MR. CARTER: 08:56:26

Q. Can you please describe your understanding of 08:56:39

what those regulations required Irico to do regarding its CRT prices? 08:56:41 08:56:45

MR. RUSHING: Objection to form in many respects. Vague as to time. Leading. Calls for a legal opinion. Lacks foundation. 08:56:48 08:56:54 08:57:00

THE WITNESS: Those are laws and regulations issued by a state department or committee, and it is mandatory. So, at Irico Group, as a state owned enterprise and the legal representative, legal person, we have the obligation to follow the laws and regulations. And in the event of any violation, Irico Group may be faced with fines or even have to bear corresponding legal liability. 08:57:58 08:58:01 08:58:06 08:58:12 08:58:17 08:58:19 08:58:26 08:58:33

BY MR. CARTER: 08:58:33

Q. Mr. Yan, you mentioned something called the National Planning Committee. 08:58:45 08:58:48

Is that also known as the State Planning Commission, or are those two different entities? 08:58:50 08:58:53

MR. RUSHING: Objection to form. Lacks foundation. 08:58:55 08:58:57

THE WITNESS: In Chinese, the meaning of that committee is a committee or commission for planning, and sometimes we short-form it to refer to it as planning committee. 08:59:35 08:59:37 08:59:43 08:59:49

But as to the names you just asked me about, 08:59:51

MR. BIRKHAEUSER: Objection. Leading. 09:30:19

THE WITNESS: Yes. 09:30:44

MR. CARTER: I have a few more questions on this document but why don't we take ten minutes so the videographer can change the tape. 09:30:54 09:30:56 09:31:00

MR. RUSHING: Okay. 09:31:02

THE VIDEOGRAPHER: We are now going off the record. The time is 9:31. 09:31:03 09:31:06

(A short recess was taken.) 09:31:11

THE VIDEOGRAPHER: We are now back on the record. The time is 9:50. 09:49:33 09:49:42

BY MR. CARTER: 09:49:48

Q. Mr. Yan, could you turn back to the page ending in 463, with the trial measures. This is still on Exhibit 8550. 09:49:48 09:49:51 09:50:00

A. Okay. 09:50:14

Q. Looking at Article 6, at the very bottom of this page, it states: "Ex-factory prices of a manufacturer shall not be lower than the industrial average production costs in principle." 09:50:15 09:50:20 09:50:24 09:50:27

Do you see that? 09:50:29

A. I see it. 09:50:44

Q. What's your understanding of the meaning of that requirement? 09:50:44 09:50:46

MR. RUSHING: Objection to form. It lacks 09:50:48

foundation. Improper legal opinion. 09:50:51

THE WITNESS: My understanding is that the 09:51:25

ex-factory prices of our Irico CRT products should not 09:51:28

be below the average production cost published by the 09:51:34

national government agencies, as referenced earlier; 09:51:41

which means that for each of the 20-inch color picture 09:52:07

tube that we manufacture, the price cannot go lower than 09:52:10

440 RMB, and the price of the 25-inch color picture tube 09:52:18

should not go lower than 720 RMB. 09:52:25

BY MR. CARTER: 09:52:25

Q. Mr. Yan, looking back at page 460, with the 09:52:45

newspaper clipping -- 09:52:48

A. Okay. 09:52:54

Q. -- the table at the bottom of that clipping is 09:52:55

titled "Industrial Average Production Cost," correct? 09:52:58

MR. RUSHING: Objection to form. 09:53:10

THE WITNESS: Yes. 09:53:11

BY MR. CARTER: 09:53:11

Q. To your understanding, if Irico Group's 09:53:17

production costs were lower than the industry average, 09:53:21

could Irico Group lawfully price its CRTs below these 09:53:27

levels? 09:53:32

MR. RUSHING: Objection to form. Lack of 09:53:33

foundation. Calls for an improper legal opinion. 09:53:36

THE WITNESS: No. 09:54:10

EXHIBIT 12

(FILED UNDER SEAL)

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

OAKLAND DIVISION

IN RE: CATHODE RAY TUBE (CRT) ANTITRUST LITIGATION This document relates to: ALL INDIRECT PURCHASER ACTIONS	Master File No. 07-CV-5944-JST MDL No. 1917

SUPPLEMENTAL EXPERT REPORT OF MARGARET E. GUERIN-CALVERT

03/16/2022

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I. Introduction

A. Qualifications

1. I am Margaret E. Guerin-Calvert, President and Senior Managing Director of FTI Consulting, Inc. Center for Healthcare Economics and Policy, a business unit that specializes in healthcare economics and applied microeconomics. I am an industrial organization economist, which is the branch of economics that involves the study of firms, industries, consumer behavior, and pricing. I continue to serve on some matters as Senior Consultant with Compass Lexecon, an independent subsidiary of FTI Consulting, Inc., a firm which specializes in antitrust and applied microeconomics. I am a founding director of its predecessor, Compass (Competition Policy Associates).

2. I have worked as an economist in public and private sectors on issues related to competition and competition policy involving a variety of industries since 1979. I served as Assistant Chief of the Economic Regulatory Section of the Antitrust Division, US Department of Justice, where among other matters I had primary responsibility for both merger and conduct matters for a variety of industries, including market power and regulatory analyses, as Economist at the Federal Reserve Board, and as an Adjunct Lecturer at Duke University's Sanford School of Public Policy (formerly the Institute of Policy Sciences). As an economic expert, I have reviewed a large number of competition issues and matters including mergers and claims of market power, coordinated effects as well as economic assessment of industry and market conditions. I have testified on matters involving economic analysis of class certification, merits/liability, and damages, among other issues. My credentials and experience encompass more than three decades of work in antitrust and regulatory policy, including qualification as an expert economist in the U.S., Canada, and New Zealand.

3. My professional expertise, including a listing of peer-reviewed publications as well as presentations, is set out in detail in my curriculum vitae, which is attached as Appendix A. Appendix B contains a list of my testimony in the last four years at trial or deposition. Compass Lexecon is being compensated for my work at my customary hourly rate of $1,410. This compensation is in no way connected to the outcome of this litigation.

B. Overview and Assignment

4. Plaintiffs in this matter are indirect purchasers of computer monitors and televisions ("finished products") that contain color display tubes ("CDTs") and color picture tubes ("CPTs"), respectively, which are two types of cathode ray tubes ("CRTs"). Plaintiffs allege that the "Defendants conspired to fix, raise, maintain and/or stabilize prices of CRT Products sold in the United States. Because of Defendants' unlawful conduct, Plaintiffs and other Class Members paid artificially inflated prices for CRT Products and have suffered antitrust injury to their business or property."[1]

5. The Indirect Purchaser Plaintiffs ("IPPs") have retained Dr. Janet Netz to offer expert economic testimony related to their claims. Dr. Netz concludes that "the cartel was successful in raising price above the competitive level."[2] In an expert report submitted in 2014, Dr. Netz also concludes that "class members were harmed as a result of the cartel's actions."[3] Dr. Netz attempts to estimate overcharges for CRTs, and concludes that, "the but-for CDT prices for 1995-2006 would have been 22.0% lower than the cartel price and for 2007 11.4% lower; the but-for CPT prices for 1995-2006 would have been 9.0% lower

[1] Indirect Purchaser Plaintiffs' Fifth Consolidated Amended Complaint, In re: Cathode Ray Tube (CRT) Antitrust Litigation, September 19, 2019 (United States District Court Northern District of California San Francisco) ("IPP Complaint"), at ¶ 1. The named Defendants are: BMCC; Irico; LG.Philips Displays (an independent joint venture that combined LG's and Philips' CRT manufacturing businesses); Panasonic Corporation, Panasonic Corporation of North America, MT Picture Display Co. (an independent entity that combined Panasonic Corporation's and Toshiba Corp.'s CRT businesses in 2003); Koninklijke Philips Electronics N.V., Philips Electronics North America Corporation, Philips Electronics Industries (Taiwan), Ltd., Philips da Amazonia Industria Electronica Ltda.; Samsung SDI Co., Ltd., Samsung SDI America, Inc., Samsung SDI Mexico S.A. de C.V., Samsung SDI Brasil Ltda., Shenzhen Samsung SDI Co., Ltd., Tianjin Samsung SDI Co., Ltd, Samsung SDI (Malaysia) Sdn. Bhd.; Samtel, Thai CRT; Toshiba Corporation, Toshiba America, Inc., Toshiba America Consumer Products, L.L.C., Toshiba America Information Systems, Inc., Toshiba America Electronic Components, Inc.; Hitachi, Ltd., Hitachi Displays, Ltd. (n/k/a Japan Display Inc.), Hitachi Asia, Ltd., Hitachi America, Ltd., Hitachi Electronic Devices (USA), Inc.; and Shenzhen SEG Hitachi Color Display Devices, Ltd.

[2] Expert Report of Janet S. Netz, Ph.D., April 15, 2014 ("Netz Report"), p. 6.

[3] Netz Report, p. 6.

than the cartel price and for 2007 3.1% lower."[4] Dr. Netz also concludes that "at least 100% of the overcharge was passed through to class members."[5] Based on these estimates, Dr. Netz concludes that the alleged cartel "imposed damages of $2.8 billion on class members."[6] Specifically, Dr. Netz estimates that IPPs incurred damages of $2.026 billion on purchases of computer monitors containing CDTs and $0.743 billion on purchases of TVs containing CPTs.[7]

6. Since Dr. Netz submitted her initial report in the merits phase of this matter, several additional expert reports have been submitted. In particular:

a) I submitted an expert report on behalf of several Defendants[8] in which I assessed whether the economic analyses related to the impact of the alleged cartel among CDT manufacturers and the estimated overcharges on CDT sales provided by Dr. Netz provide a reliable and economically sound basis to estimate damages to the IPP class.[9]

b) Similarly, Professor Robert D. Willig submitted an expert report on behalf of the same Defendants in which he assessed whether the economic analyses related to CPT damages provided by Dr. Netz provide a reliable and sound basis to estimate damages to the IPP class.[10]

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[4] Errata to the Expert Report of Janet S. Netz, Ph.D, July 3, 2014 ("Netz Report Errata"), p. 1.

[5] Netz Report, p. 6.

[6] Netz Report Errata, p. 1.

[7] Netz Report Errata, Exhibit ER-81.

[8] Specifically, I was retained by Winston & Strawn LLP representing Panasonic Corporation of North America, MT Picture Display Co., Ltd., and Panasonic Corporation (f/k/a Matsushita Electrical Industrial Co.); Kirkland & Ellis LLP representing Hitachi, Ltd., Hitachi Asia, Ltd., Hitachi America, Ltd., Hitachi Electronic Devices (USA), Inc., and Hitachi Displays, Ltd. (n/k/a Japan Display Inc.); White & Case LLP representing Toshiba America Consumer Products, L.L.C., Toshiba America Electronic Components, Inc., Toshiba America, Inc., Toshiba America Information Systems, Inc., and Toshiba Corporation; Sheppard, Mullin, Richter & Hampton LLP representing Samsung SDI America, Inc., Samsung SDI Co. Ltd., Samsung SDI (Malaysia) Sdn. Bhd., Samsung SDI Mexico S.A. De C.V., Samsung SDI Brasil Ltda., Shenzen Samsung SDI Co., Ltd., and Tianjin Samsung SDI Co., Ltd.; and Baker Botts LLP representing Koninklijke Philips N.V., Philips Electronics North America Corporation, Philips Taiwan Limited, and Philips do Brasil Ltda.

[9] Expert Report of Margaret E. Guerin-Calvert, August 5, 2014 ("Guerin-Calvert Report").

[10] Expert Report of Robert D. Willig, August 5, 2014 ("Willig Report").

c) Dr. Netz subsequently submitted a rebuttal expert report in which she responded to, among other reports, my initial report and Professor Willig's initial report.[11]

d) I subsequently submitted a surrebuttal expert report in which I responded to the CDT-related analyses and conclusions in Dr. Netz's rebuttal report.[12]

e) Professor Willig also submitted a surrebuttal expert report that responded to the CPT-related analyses and conclusions in Dr. Netz's rebuttal report.[13]

7. Counsel from Baker Botts, representing Defendants Irico Group Corp. ("Irico Group") and Irico Display Devices Co., Ltd. ("Irico Display," collectively, "Irico"), have now asked me to consider the analyses and economic conclusions in these reports in the context of IPPs' claims against Irico.[14]

8. Counsel for Irico have also asked me to consider whether a focus on Irico in the alleged cartel has any additional implications for Dr. Netz's analyses and conclusions beyond the conclusions reached in my previous reports and in Professor Willig's previous reports.[15] Specifically, counsel has asked me to make the following four assumptions and

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[11] Rebuttal Expert Report of Janet S. Netz, Ph.D., September 26, 2014 ("Netz Rebuttal Report").

[12] Expert Surrebuttal Report of Margaret E. Guerin-Calvert, November 6, 2014 ("Guerin-Calvert Surrebuttal Report").

[13] Expert Surrebuttal Report of Robert D. Willig, November 6, 2014 ("Willig Surrebuttal Report").

[14] Irico is a Chinese state-owned company that manufactured, directly or indirectly, CPTs and CDTs in China during the relevant period. Irico Display, an indirect subsidiary of Irico Group during the relevant period, also manufactured CPTs and CDTs in China during the relevant period.

[15] I examined Dr. Netz's analysis of global CPT and CDT production shares, which were based on contemporaneous information or documentary sources. While not accepting these share estimates, I note that based on Dr. Netz's analysis, Irico's share of global CPT shipments was 4.2% in 2000, the first year for which she has CPT share information, and averaged 5.9% over the course of 2000-2006. (See Dr. Netz's backup file "CPT Share.do," which relies on MTPD-0416090) Dr. Netz did not identify any sources for pre-2000 CPT shares.

Dr. Netz also did not identify any sources indicating that Irico sold any CPTs to customers in North America.

As for CDTs, Dr. Netz's analysis suggests that Irico's share of global CDT production during the class period was *de minimis*. In particular, the sources on which Dr. Netz relies for her global market share estimates only identify CDT production by Irico in 1996-2000. (See Dr. Netz's backup file, "defendant_cdt_share.dta.") According to the file she relies upon to calculate global

(footnote continued …)

assess their implications for Dr. Netz's analyses and conclusions, including her assessment and estimation of damages:

a) IPPs cannot establish that Irico participated in the alleged cartel with respect to either CDTs or CPTs prior to August 1998 and therefore it would not be liable for any damages allegedly incurred by the IPPs prior to August 1998.

b) Irico did not manufacture any CPTs with a diameter larger than 29 inches from March 1, 1995 to November 25, 2007 ("the class period").

c) For at least some portion of the class period, Irico and other Chinese manufacturers were subject to regulation of their prices for certain categories of CPTs to keep them above a specific "floor" determined by the Chinese government.

d) The horizontal communications relating to CPTs in which IRICO allegedly engaged were not directed at North American customers.

9. For the purposes of my analysis, I have been asked to assume arguendo that 100% of any CRT overcharges were passed through to IPPs, which is the pass-through rate used by Dr. Netz to obtain her damages estimates.[16]

10. A list of the materials I relied on in this matter is attached as Appendix C.

11. My analysis is ongoing, and I reserve the right to evaluate any new reports or analysis produced by the Plaintiffs or their experts as well as to incorporate any new information into my analysis and opinions as necessary.

CDT shares for 1996-2000, Irico's share of global CDT production during this period averaged 0.5%. (SDCRT-0201291; Irico is referred to as "Caihong" in this file.) For the remaining years of the class period, Dr. Netz does not identify any CDT production attributable to Irico. In several of these years (2001-2004), Dr. Netz identifies CDT production shares for one or more other entities or for an "other [manufacturers]" category with a share of around 1% or less. (See Dr. Netz's backup file, "defendant_cdt_share.dta.")

[16] In making this assumption, I am in no way endorsing 100% as the correct pass-through rate of any overcharges to IPPs. I am aware that Professor Janusz Ordover submitted a report in this matter in which he criticized Dr. Netz's pass-through analyses and indicated that "on average only 45 percent of the CDT overcharges estimated by Ms. Guerin-Calvert were passed through to the ultimate consumers and only 54 percent of the CPT overcharges estimated by Prof. Willig were passed through to the ultimate consumers." (Expert Report of Janusz A. Ordover, Ph.D., August 5, 2014, ¶ 63 (referencing Figure 7).) Professor Ordover's reference to "CDT overcharges estimated by Ms. Guerin-Calvert" and to "CPT overcharges estimated by Prof. Willig" refer to the economically appropriate adjustments made to Dr. Netz's overcharge modeling in the Guerin-Calvert and Willig reports; for more detail, see ¶ 20 below.

II. Overview of Conclusions

12. Based on an application of standard economic principles and methods used to evaluate claims of alleged collusive conduct and potential impact on prices and other market conditions to the facts of this industry, and specifically to the analyses and conclusions set out in Dr. Netz's report, I have reached the conclusions summarized below.

13. I reaffirm the conclusions and underlying analyses presented in my previous reports in this matter, including:

a) Both the underlying economic conditions of supply, demand, and competition as well as the allegations of collusive conduct differ substantially for CDTs and CPTs. Accordingly, it makes economic sense to analyze the impact and damages of the alleged cartel separately for CPTs and CDTs. This is consistent with the fact that Dr. Netz analyzes the alleged collusive conduct and estimates overcharges separately for CDTs and CPTs.[17]

b) Application of the economic literature on cartels to the facts of the CDT industry reveals several factors that make effective coordination of pricing and thereby alleged collusive overcharges difficult and hence less likely to be successful both generally, and in the CDT industry.[18]

c) Plaintiffs' and Dr. Netz's claims of a highly effective conspiracy generating large collusive overcharges ignore or are at odds with basic empirical evidence on CDT prices, capacity, output, and their drivers.[19]

d) Dr. Netz's analyses of alleged collusive conduct do not imply a highly effective conspiracy or large overcharges.[20]

e) Dr. Netz's own econometric model of CDT overcharges undermines her claim that the alleged cartel had a class-wide impact.[21]

f) Dr. Netz's model of CDT overcharges is fundamentally unreliable and does not support a claim of substantial overcharges.[22]

g) Despite these fundamental flaws, if Dr. Netz's model were to be used to estimate CDT overcharges, several basic problems with her model should be

[17] Guerin-Calvert Report, ¶ 9.

[18] *Id.*, ¶ 10.

[19] *Id.*, ¶ 11.

[20] *Id.*, ¶ 12.

[21] *Id.*, ¶ 13.

[22] *Id.*, ¶ 14.

corrected. When I make economically appropriate corrections for these major flaws in Dr. Netz's model, the overall average CDT overcharge percentage for 1995-2006 declines from Dr. Netz's reported figure of 22 percent to an estimate of 1.6 percent.[23]

h) The responses offered by Dr. Netz in her rebuttal report are flawed and do not undermine or alter the conclusions I articulated in my initial report.[24]

14. I have reviewed the conclusions and underlying analyses presented in the expert reports that Professor Willig has previously submitted in this matter, considered and assessed the analyses detailed in his reports using my independent expertise and judgment, and I concur with and adopt his conclusions and the underlying analyses in full as reflecting my own expert opinion.[25] These conclusions include:

a) "Salient characteristics of the CPT industry were not conducive to effective and sustained class-wide elevations of CPT prices resulting from collusion."[26]

b) "Defendants' conduct was inconsistent with a sustained and effective CPT cartel."[27]

c) "Straightforward evidence on CPT prices, margins and capacity do not support Dr. Netz's claim of a highly successful CPT cartel."[28]

d) "Dr. Netz's model of CPT overcharges undermines her claim that the alleged cartel had a class-wide impact because it finds potentially no damages after 1997 and potentially no damages for large CPTs."[29]

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[23] *Id*., ¶¶ 15-16. As I have previously stated, the corrections address "some of the major economic and statistical problems with Dr. Netz's model" and thereby improve the model, but they do not fully rectify the lack of robustness and reliability of her model. (Guerin-Calvert Report, ¶¶ 130-131; Deposition of Margaret E. Guerin-Calvert, September 17, 2014, pp. 216-217.)

[24] Guerin-Calvert Surrebuttal Report, ¶ 16. See Appendix D for a more detailed summary of my opinions from my surrebuttal report.

[25] Professor Willig is presently unavailable to serve as an expert in this matter.

[26] Willig Report, ¶ 9(b).

[27] Willig Report, ¶ 9(c).

[28] Willig Report, ¶ 9(d).

[29] Willig Report, ¶ 9(e). Dr. Netz assumes that any CPT overcharge was constant from 1995-2006. As Professor Willig demonstrated, when the estimated CPT overcharge in Dr. Netz's model is allowed to vary by year—with no other changes made to her model—it yields no positive overcharge estimates after 1997. (Willig Report, ¶ 73.)

e) "Dr. Netz's model of CPT overcharges is fundamentally unreliable and does not validly support a claim of substantial overcharges. In particular, Dr. Netz's model crucially assumes that the model includes all material economic determinants of CPT prices and also that the underlying relationships between the economic factors and CPT prices did not change materially during the 18-year estimation period. As such, the model assumes that the only reason (after controlling for the included economic factors) that prices were higher during the class period is the alleged collusive conduct by manufacturers. However, standard tests show that relationships between CPT prices and the economic variables included in Dr. Netz's model were not at all stable during the 18-year period (consistent with dramatically changing market conditions for CPTs). Moreover, the model excludes basic economic determinants (such as product quality) of CPT prices. For both these reasons, Dr. Netz's model produces completely unreliable estimates of collusive overcharges."[30]

f) "Despite these fundamental flaws, if Dr. Netz's model were to be used to estimate CPT overcharges, then her model should be modified to better control for changes in market conditions. Making reasonable modifications to her model to include relevant economic variables and better control for changes in market conditions result in an estimated CPT overcharge of 2.3% during the 1995-2006 period and a negative overcharge in 2007. Although these corrections improve Dr. Netz's model of CPT overcharges, they do not remedy the fundamental flaw described in this report."[31]

g) "[I]n her rebuttal report, Dr. Netz has failed to provide a valid defense of her fundamentally flawed approach to estimating overcharges. Even if Dr. Netz's flawed approach is employed to estimate damages, nothing in her rebuttal report undermines my view that simple extensions to her model that better control for market conditions lead to much smaller CPT overcharges than Dr. Netz's estimates. Consistent with this, Dr. Netz fails to establish that the pricing conduct of the alleged cartel members was typically consistent with the conduct alleged by Plaintiffs. In fact, the record evidence and my analysis indicate that alleged cartel members typically did not adhere to the pricing agreements alleged by Dr. Netz."[32]

15. In addition to these conclusions, I have reached the following conclusions from a focus on Irico and the specific assumptions (which I discuss in greater detail in the next section):

[30] Willig Report, ¶ 9(f).

[31] Willig Report, ¶ 9(g).

[32] Willig Surrebuttal Report, p. 41. See Appendix E for a more detailed summary of Professor Willig's opinions from his surrebuttal report.

a) Making the assumption that IPPs cannot demonstrate that Irico participated in any alleged activity and is not liable for IPP damages caused by the alleged cartel prior to August 1998, while making no other changes to Dr. Netz's analyses, reduces her IPP damages estimates for all alleged cartel members from $2.8 billion to $1.6 billion. Furthermore, making the same economically appropriate corrections described and applied in the 2014 reports by Professor Willig and me to Dr. Netz's overcharge models further reduces the IPP damages estimate to $203 million.

b) CPTs with a diameter larger than 29 inches are estimated to account for roughly $162 million in damages using Dr. Netz's volume of commerce and overcharge estimates, which is approximately 22% of Dr. Netz's CPT damages estimates.

c) Economic modeling of overcharges requires evaluating and estimating the but-for prices that would prevail absent the alleged conduct at issue. In the present context, this implies that Dr. Netz would need to consider factors that could influence the alleged cartel members' pricing in the but-for world. The price floors set by the Chinese government for at least some categories of CPTs during at least some portions of the class period represent a potential constraint on but-for pricing. Dr. Netz's failure to account for these floors in her overcharge model potentially is likely yet another reason why her overcharge model is unreliable, particularly where the average but-for prices of CPTs manufactured in China that are implied by her model are below the corresponding price floors.

d) Many of the CRT TVs purchased in the U.S. contained CPTs sold in North America, and the North American CPT marketplace differed in material ways from the rest of the world. Thus, there is no basis to assume as Dr. Netz does that an overcharge estimated using global CPT sales data would reliably estimate overcharges for CPTs sold in North America and hence provide a reliable basis for estimating damages incurred by IPP class members in the U.S. This also implies that, if, as I have been asked to assume, horizontal communications relating to CPTs in which IRICO allegedly engaged were not directed at North American CPT customers, Dr. Netz's model would not reliably reflect the impact of this conduct on IPPs.

III. Consideration of the Implications of an Irico Focus and Assumptions on Dr. Netz's Analyses and Conclusions

16. In this section, I analyze the implications of an Irico focus on Dr. Netz's analyses and conclusions, including with respect to her estimation of damages.

A. Irico's Non-Participation in the Alleged Cartel Prior to August 1998

17. As indicated above, I was asked to assume that IPPs cannot demonstrate that Irico participated in the alleged cartel with respect to either CDTs or CPTs prior to August 1998.

Consistent with this assumption, the list of alleged target prices identified by Dr. Netz in her reply report does not identify any horizontal communications involving Irico that occurred prior to August 1998.[33] I was also asked to assume that Irico is not liable for any damages allegedly incurred by the IPPs prior to August 1998. This section sets out the implications of these assumptions for Dr. Netz's IPP damages estimates.

18. Dr. Netz concludes that "[t]he but-for CDT prices for 1995-2006 would have been 22.0% lower than the cartel price and for 2007 11.4% lower; the but-for CPT prices for 1995-2006 would have been 9.0% lower than the cartel price and for 2007 3.1% lower."[34] Dr. Netz also concludes that "at least 100% of the overcharge was passed through to class members."[35] Dr. Netz estimates that the IPPs' expenditures on CDTs and CPTs during the class period were $9.2 billion and $8.3 billion, respectively.[36] Based on these estimates, Dr. Netz concludes that the total damages incurred by IPPs on purchases of finished products containing CDTs and CPTs manufactured by all alleged cartel members was $2.026 billion and $743 million, respectively, for a total of $2.769 billion.[37]

19. Dr. Netz's total damages estimates include the period 1995 through August 1998. Removing Dr. Netz's damages estimates for the period prior to August 1998 from her total damages estimates (while making no other changes to her analysis or calculations) reduces her damages estimates for IPPs' purchases of finished products containing CDTs and CPTs

[33] Netz Rebuttal Report backup materials, "Target price-structure.xlsx" (the earliest meeting Dr. Netz identified that Irico purportedly attended and at which a target price was set took place on November 6, 1998. Dr. Netz also identified alleged target prices for "Chinese manufacturers" from an August 21, 1998 meeting that she does not claim Irico attended).

[34] Netz Report Errata, p. 1.

[35] Netz Report, p. 6.

[36] Netz Report, Ex. 80.

[37] Netz Report Errata, Ex. ER-81.

manufactured by all alleged cartel members to $1.136 billion and $485 million, respectively, for a total of $1.621 billion.[38] (See Appendix F, Table 2.)[39]

20. This reduced estimate of overcharges, while adjusting for the 1995-August 1998 period, however, does not adjust for the economically appropriate changes to Dr. Netz's model made in the Guerin-Calvert and Willig 2014 reports relating to CDTs and CPTs, respectively. Making the number of economically appropriate corrections that were described in the expert reports submitted by Professor Willig and me in 2014 to Dr. Netz's CPT and CDT overcharge models yields signifcantly lower overcharge estimates for both CPTs and CDTs in Dr. Netz's models. Specifically, after making these improvements to Dr. Netz's models, the models indicate that: (i) but-for CDT prices for 1995-2006 would have been 1.6% lower than actual CDT prices,[40] (ii) but-for CDT prices for 2007 would not have been lower than actual CDT prices,[41] (iii) but-for CPT prices for 1995-2006 would have been 2.3% lower than actual CPT prices,[42] and (iv) but-for CPT prices for 2007 would

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[38] Removing Dr. Netz's damages estimates for only the period prior to January 1998 reduces her damages estimates for IPPs' purchases of finished products containing CDTs and CPTs manufactured by all alleged cartel members to $1.246 billion and $528 million, respectively, for a total of $1.774 billion.

[39] Table 2 in Appendix F uses Dr. Netz's volume of commerce for these products and her estimated overcharges for the relevant period, which are found at Netz Report, Exhibit 80 and Netz Report Errata, p. 1.

[40] Guerin-Calvert Report, ¶¶ 130-131. The economically appropriate corrections that I made to Dr. Netz's CDT overcharge model were: (i) I relaxed the arbitrary assumption of a constant overcharge over the entire 1995-2006 period by replacing Dr. Netz's single variable for 1995-2006 with three separate variables for 1995, 1996 and 1997-2006; (ii) because the evidence indicates that the estimated effects for 1995 and 1996 likely were caused by underlying economic conditions unrelated to the alleged conspiracy, I assumed that the overcharge in 1995 and 1996 was the same percentage (1.6 percent) as the overcharge that the modified model estimates for the years 1997-2006; (iii) I added additional economically reasonable control variables that substantially improve the performance of the model as discussed above, and (iv) I corrected Dr. Netz's arithmetic error in applying the overcharge percentage to the estimated CDT revenue. (*Id*., ¶ 130.)

[41] *Id.*, ¶¶ 130-131 and Table 8.

[42] Willig Report, ¶ 101. The economically appropriate corrections that Professor Willig made to Dr. Netz's CPT overcharge model were to add the following control variables: (i) on the supply-side: a global shipping cost index, an index of labor cost in Korea, and the Korean Won-U.S.

(footnote continued …)

not have been lower than actual CPT prices.[43] Applying these overcharge estimates—while adopting arguendo the 100% pass-through rate used by Dr. Netz and her estimate of the IPPs' expenditures on CDTs and CPTs during the class period—yields IPP damages estimates for IPPs' purchases during the full class period of finished products containing CDTs and CPTs manufactured by all alleged cartel members of $143 million and $188 million, respectively, for a total of $331 million. (See Appendix F, Table 3.)

21. Removing the damages estimates for the period prior to August 1998 (in the same way as described above for the unadjusted estimates) from these revised damages totals further lowers the damages estimates for IPPs' purchases of finished products containing CDTs and CPTs manufactured by all alleged cartel members to $80 million and $123 million, respectively, for a total of $203 million.[44] (See Appendix F, Table 4.)

B. Irico's Lack of Production of the Largest CPTs

22. As noted above, I have been asked to assume that Irico did not produce any CPTs with a diameter larger than 29 inches during the class period. I note that CPTs of this size are estimated to account for roughly $162 million in estimated damages in Dr. Netz's model, which is approximately 22% of Dr. Netz's CPT damages estimates.[45] (See Appendix G, Table 1.)

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dollar exchange rate (the only supply-side variable that Dr. Netz includes in her CPT overcharge model is the cost of specialty glass in Korea), (ii) on the demand-side, sales in U.S. electronics retail stores. (*Id*., ¶ 100.)

[43] *Id*.

[44] Removing the damages estimates for only the period prior to January 1998 reduces the estimates for IPPs' purchases of finished products containing CDTs and CPTs manufactured by all alleged cartel members to $88 million and $134 million, respectively, for a total of $222 million.

[45] This estimate was obtained by multiplying an estimate of Dr. Netz's estimated volume of commerce associated with CPTs with a diameter larger than 29 inches by Dr. Netz's estimated overcharge. If, instead, the estimate of Dr. Netz's estimated volume of commerce associated with CPTs with a diameter larger than 29 inches is multiplied by the overcharge estimate that is obtained by applying the same economically appropriate corrections described and applied in the 2014 reports by Professor Willig to Dr. Netz's CPT overcharge model, the resulting damages

(footnote continued …)

C. Irico CPTs Subject to Chinese Price Regulation

23. As noted above, I have been asked to assume that, for at least some portion of the class period, Irico and other Chinese manufacturers were subject to regulation of their prices for certain categories of CPTs to keep them above a specific "floor" determined by the Chinese government. A November 16, 1998 notification from the State Planning Commission and State Economic and Trade Commission of the People's Republic of China announced regulations it described as "important measures taken by the state to regulate prices on the market of industrial products."[46] These regulations defined prohibited "unfair price actions" to include "[e]x-factory prices of industrial products sold by a manufacturing enterprise [that] are lower than its production costs" and specified that such prices "shall not be lower than the industrial average production costs in principle."[47]

24. Specific to CRTs and products containing CRTs, the Ministry of Information Industry of the People's Republic of China ("MII-PRC") issued a Notification requiring certain manufacturers to report "production and cost information of 21" and 25" color TVs or color CRTs in the 4th quarter of 1998" for the purpose of "estimat[ing] and publish[ing] average industry production costs."[48] The Notification also stated that "enterprises with sales prices lower than the average industry production costs" would be investigated and punished if found to be engaged in "unfair price competition."[49] The MII-PRC then issued a further Notification containing the following statement in April 1999:

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estimate for CPTs of this size is $41 million, which is 22% of the CPT damages estimate obtained using Dr. Netz's volume of commerce estimate for all CPTs sizes and the revised overcharge estimate described and applied by Professor Willig.

[46] "Notification of the State Planning Commission and the State Economic and Trade Commission Regarding Issuing Regulations on Preventing Unfair Price Actions through Dumping of Industrial Products and Strengthening Price Self-Discipline of Industries," November 16, 1998, Certified Translation ("1998 Notice"), ¶ 1. See, also, Expert Report of Donald Clarke, March 16, 2022 ("Clarke Report"), ¶¶ 12(a), 16.

[47] 1998 Notice, Articles 5(I) and 9; See, also, Clarke Report, ¶¶ 16-19.

[48] "Notification of Reporting Cost Information for Color TV and Color CRT Industry," MII-PRC, February 3, 1999, Certified Translation ("1999 Reporting Notice"), ¶¶ 1-2. See, also, Clarke Report ¶ 12(b).

[49] 1999 Reporting Notice, ¶ 2.

> To prevent actions of unfair price competition in the color CRT and color TV industry and maintain a normal market order, this Ministry performed estimation on the industrial average production costs of two types of color CRTs and color TVs, i.e. 21 inches and 25 inches, pursuant to the Trial Measures to Prevent Unfair Price Competition Regarding Color CRTs and Color TVs by the State Planning Commission and the Ministry of Information Industry. The estimation was made according to cost materials reported by major manufacturers of color CRTs and color TVs and combined with the results of investigation on typical enterprises. The estimation is hereby published (see the attached table). All color CRT and color TV manufacturing enterprises are asked to seriously implement the estimation. In the case where a manufacturing enterprise sells the products at prices lower than the published industrial average production costs to cause market disorders and harm the interests of other manufacturing enterprises, a harmed enterprise may file a report with the State Planning Commission or a competent department in charge of prices of a province, autonomous region or municipality directly under the Central Government. In the case where it is confirmed through investigation that there is indeed an action of unfair price competition, a competent government department in charge of prices shall order the responsible party to correct and impose penalties according to specific situations.[50]

25. The statement includes a table with the following average production costs that would serve as potential CPT price "floors": $53.14 for 21-inch CPTs and $86.96 for 25-inch CPTs.[51] The table also includes analogous price floors for 21-inch and 25-inch CRT TVs.[52] The statement calls for the price floors to take effect on April 2, 1999.[53]

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[50] "Notification of Publishing Industrial Average Production Costs for Some Types of Color CRT and Color TVs," MII-PRC, April 2, 1999, Certified Translation ("April 1999 Cost Notification"). See, also, Clarke Report ¶ 12(e).

[51] April 1999 Cost Notification, Attached Table. See, also, Clarke Report, ¶ 24. The document expresses the average costs in the Chinese renminbi/yuan. I have converted these figures to U.S. dollars using the exchange rate of 8.28 Chinese Yuan per U.S. Dollar that prevailed from October 1998 to June 2005. (See, e.g., "Dollar Yuan Exchange Rate – 35 Year Historical Chart," *Macrotrends*, available at https://www.macrotrends.net/2575/us-dollar-yuan-exchange-rate-historical-chart>.)

[52] April 1999 Cost Notification, p. 3.

[53] *Id*. (The statement is dated April 2, 1999, and states, "This Notification shall go into effect as of the date of issuance.")

26. The following year, the MII-PRC issued a similarly-worded statement setting the following price floors, effective September 13, 2000: $49.52 for 21-inch CPTs, $80.92 for 25-inch CPTs, and $137.08 for 29-inch CPTs.[54]

27. As one treatise on estimating antitrust damages has explained, when evaluating but-for prices and estimating overcharges:

> [I]t is necessary to construct a but-for price that the defendant would have charged lawfully. To isolate the effect of the violation and avoid awarding damages for conduct that would be lawful, it is important to modify the defendant's conduct in the but-for world only to the extent necessary to comply with the law.[55]

28. Economic modeling of overcharges requires evaluating and estimating the but-for prices absent the alleged conduct at issue.[56] In the present context, this implies that Dr. Netz would need to consider supply and demand as well as regulatory factors such as these that could influence the alleged cartel members' pricing in the but-for world. The price floors set by the Chinese government represent a potential constraint on but-for pricing; thus Dr. Netz's failure to account for these floors in her overcharge model potentially is yet another reason her overcharge model is unreliable. Specifically, if the but-for prices implied by Dr. Netz's CPT overcharge model are below the relevant Chinese government price floors, and if the government regulations limited or influenced Chinese manufacturers' ability or incentive to charge prices below those floors (or at least their ability or incentive to set prices as far below the floors as potentially implied by Dr. Netz's overcharge estimates), it would imply that Dr. Netz has overstated the overcharges

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[54] "Notification of Publishing Industrial Average Production Costs for Some Types of Color CRTs," MII-PRC, September 13, 2000, Attached Table. See, also, Clarke Report, ¶¶ 12(g), 24. As with the April 1999 price floors, this document expresses the average costs in the Chinese renminbi/yuan, and I have converted these figures to U.S. dollars.

[55] American Bar Association Section of Antitrust Law, *Proving Antitrust Damages: Legal and Economic Issues*, 2nd ed., ABA Publishing, 2010, pp. 54-55.

[56] See, e.g., Hastings, Justine S., and Michael A. Williams, "What Is a 'But-For World'?," *Antitrust*, vol. 31, no. 1, Fall 2016, p. 102; Rubinfeld, Daniel L. (2012), "Antitrust Damages," in Elhauge, Einer, ed. *Research Handbook on the Economics of Antitrust Law*, Edward Elgar, p. 380; and Burtis, Michelle M. and Keller Marku, "Proving the Fix: Damages," *Global Competition Review*, November 22, 2021, p. 1.

associated with the alleged cartel, at least for some CPTs. That is, by failing to consider the implications of the Chinese government price floors, Dr. Netz's model likely would produce unreliable estimates of but-for prices and thus of the resulting overcharges.

29. In order to illlustrate the potential implications of the Chinese government's price floors on the but-for prices predicted by Dr. Netz's model, I examined the transactions data relied upon by Dr. Netz in her overcharge model. This examination for illustrative purposes included three steps. First, for each of the announced government price floors, I calculated the contemporanous (quantity weighted) average transactions price for CPTs of the size associated with the announced floor that were manufactured in China in Dr. Netz's data. Second, I calculated the average but-for prices for those transactions that are implied by Dr. Netz's estimated overcharge of 9.0% for 1995-2006. Third, I examined whether Dr. Netz's implied but-for prices were lower than the announced government price floors. Table 1 below shows the results of this analysis.

Table 1 – Dr. Netz's Estimated But-For Prices for Certain CPTs Manufactured in China Were Below the Price Floors Set by the Chinese Government

Chinese Government Announcement Date	CPT Size	Price Floor Set by Chinese Government	Average Netz But-For Price of CPTs Made in China	Netz But-For Price below the Price Floor?
4/2/1999	21-inch	$53.14	$47.77	Yes
4/2/1999	25-inch	$86.96	*n/a*	*n/a*
9/13/2000	21-inch	$49.52	$47.03	Yes
9/13/2000	25-inch	$80.92	*n/a*	*n/a*
9/13/2000	29-inch	$137.08	$134.63	Yes

Sources: Document 5229-4, Document 5229-7, Netz Report Errata

Notes: (i) Announced CPT floor prices were converted to USD using the contemporaneous exchange rate of 8.28 CNY per USD. (ii) For the price floor announced on 4/2/1999, average actual prices were calculated for Q2 1999; and for the price floor announced on 13/9/2000, average actual prices were calculated for Q4 2000. (iii) The transactions price data relied upon by Dr. Netz do not include any sales of 25-inch CPTs manufactured in China in Q2 1999 or Q4 2000. (iv) The implied but-for prices were calculated using Dr. Netz's CPT overcharge estimate of 9.01%. (v) The Netz but-for prices in the first, third, and fifth rows of the table are based on total CPT sales of approximately 575K, 484K, and 264K, respectively.

30. The illustrative examples in Table 1 shows that Dr. Netz's implied but-for price is below the corresponding government price floor in each of the three instances for which

transactions data are available.[57] That is, at Dr. Netz's implied but-for prices, these suggest that Chinese manufacturers would have had to charge CPT prices below the contemporaneous price floor. Dr. Netz presents no assessment indicating that Chinese CPT manufacturers would have charged prices at these levels below the government price floors as implied by her CPT overcharge estimate. If the government regulations limited or influenced Chinese manufacturers ability or incentive to do so, Dr. Netz's failure to account for the effect of such price floors would cause her to misstate and overstate CPT overcharges.

D. Irico's Lack of Horizontal Communications that Were Directed at North American CPT Customers

31. As set out above, Dr. Netz estimates a single global overcharge for CPTs and applies that estimate to CPTs sold in North America when estimating damages allegedly sustained by members of the IPP class in the U.S. for CPTs. In effect, she assumes that there were no material differences in market conditions or other factors in North America and the rest of the world that could have affected the impact of the contested conduct on CPT prices.

32. However, many of the CRT TVs purchased in the U.S. contained CPTs sold in North America, and the North American CPT marketplace differed in material ways from the rest of the world.[58] These differentiators between North America CPTs and the rest of

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[57] The transactions data do not contain any contemporaneous prices for 25-inch CPTs manufactured in China.

[58] Record evidence and U.S. government data demonstrate that U.S. and Mexico manufacturing together accounted for a large share of CRT TVs purchased in the U.S. U.S. Census data indicate that around 40% of CRT TVs purchased in the U.S. were manufactured in the U.S., and record evidence indicates that CRT TVs manufactured in Mexico account for a large share of the CRT TVs that were imported to the U.S.

According to U.S. Census data, between 1996-2002, 44% of TVs purchased in the U.S. were manufactured in the U.S.; from 1996-2006, this share was 39%. (See Appendix H.)

I understand that the share of CRT TVs purchased in the U.S. that were manufactured elsewhere in North America, particularly in Mexico, was substantial. For example: all of the TVs that Panasonic North America ("PNA") sold were manufactured in Mexico (Deposition of Edwin

(footnote continued …)

the world include factors identified already in Professor Willig's expert reports or in other testimony; in particular:

a) A substantial share of CPTs sold in North America were manufactured in North America.[59]

b) CPTs sold in North America were substantially more likely to have a diameter of 25-inches or larger ("large CPTs") than CPTs sold in the rest of the world (53% vs. 19%).[60] Since large CPTs were displaced earlier and to a greater extent by LCD and plasma technologies, the pricing of large CPTs (and thus of CPTs sold in North America) was more likely to be constrained earlier and to a greater extent by competition from LCD and plasma TVs.[61]

c) Dr. Netz "has not identified any [target prices] that she contends specifically applied to CPTs sold in North America."[62]

d) Even if the target prices that Dr. Netz identified also applied to CPTs sold in North America, they applied to an even smaller share of CPTs sold in North America (at most 9.9%) than CPTs sold outside of North America (at most 17.5%) during the class period.[63]

Wolff (PNA), July 18, 2012, pp. 49-50); most of the CRT TVs that Samsung Electronics America ("SEA") sold were manufactured by Samsung Electronics Corporation ("SEC") in Mexico (Deposition of Steve Panosian (SEA), 30(b)(6), July 17, 2012, pp. 21-22); all of the CRT TVs that LGE sold under the Zenith brand in the U.S. were manufactured in Mexico (Deposition of Yun Seok Lee (LGE), July 11, 2012, pp. 54, 58); and the CRT TVs sold by Hitachi Home Electronics America ("HHEA"), a division of Hitachi America Ltd. ("HAL"), were manufactured by Hi Mex in Mexico (Deposition of William Whalen (HAL), August 23, 2012, pp. 17-18). More generally, I understand that the area of Mexico near the U.S. border was a preferred area for producing CRT TVs due to the combination of low labor cost, proximity to the U.S., and absence of import duties. (Deposition of Roger de Moor (Philips), July 31, 2012, pp. 243-244)

[59] Deposition of Jay Heinecke (TAEC), July 31, 2012, p. 64; Deposition of Jaein Lee (SDI), 30(b)(6), June 6-7, 2012, pp. 133-134, 179-180; Deposition of Michael Son (SDI), February 5, 2013, p. 193.

[60] Willig Report, ¶ 96 (5th sub-bullet).

[61] Willig Report, ¶ 19. This is consistent with the fact the prices of large CPTs declined more rapidly than the prices for smaller CPTs once the plasma and LCD TVs became more price competitive with CRT TVs after 2000. (*Id.*)

[62] Willig Report, ¶ 96 (2nd sub-bullet).

[63] Willig Report, ¶ 96 (3rd sub-bullet). In this context, a CPT sale is treated as having an applicable target price if: (i) Dr. Netz identified at least one target price for the same manufacturer, size, finish, shape (if it is possible to identify the shape of the CPT sold), and

(footnote continued …)

e) Changes in the alleged target prices were even poorer predictors of changes in actual prices for CPTs sold in North America than in the rest of the world. Specifically, changes in the alleged target prices explain only 2.6% of the variation in changes in the actual prices of CPTs sold in North America as opposed to 3.9% of the changes in actual prices of CPTs sold outside of North America. Similarly, on average, a 5% change in the alleged applicable target price identified by Dr. Netz is associated with only a 0.67% increase in the actual prices of CPTs sold in North America during the same quarter as compared to an increase of 0.95% in the actual prices of CPTs sold in North America.[64]

33. Given the substantial share of U.S. CRT TVs containing CPTs sold in North America and the material economic differences between the North American marketplace and the rest of the world discussed in the previous paragraph, there is no basis to assume as Dr. Netz does that an overcharge estimated using global CPT sales data would reliably estimate overcharges for CPTs sold in North America and hence provide a reliable basis for estimating damages incurred by IPP class members in the U.S. Moreover, this has been evaluated in expert reports on Dr. Netz's modeling. Specficially, in evaluating the sensitivity of Dr. Netz's model to these issues, Professor Willig's analyses showed that when Dr. Netz's CPT overcharge model is applied only to North American CPT transactions, it produces overcharge estimates that are lower than Dr. Netz's estimates by more than 40%.[65] Moreover, in further assessment of the reliability of Dr. Netz's global overcharge model for estimating overcharge for CPTs sold in North America, Professor Willig's analysis showed that when Dr. Netz's CPT overcharge model is estimated using only North American CPT prices and with North American-specific versions of her global market controls included, it lowers her estimated overcharge for 1995-2006 by nearly 80%, and this overcharge estimate is both statistically *distinguishable* from Dr. Netz's overcharge estimate for global CPT sales and statically *indistinguishable* from zero, "i.e.,

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month as the CPT sold, and (ii) the manufacturer attended the relevant meeting at which the target price was discussed or if there is some indication in the meeting minutes that the manufacturer agreed to the target price. (*Id.*, Exhibit 6.)

[64] Willig Report, ¶ 96 (4th sub-bullet).

[65] Willig Report, ¶ 98.

one cannot reject the possibility that there was no impact of the alleged cartel on North American CPT prices."[66]

34. As noted above, I have been asked to assume that the horizontal communications relating to CPTs in which Irico allegedly engaged were not directed at North American CPT customers. When viewed in the context of the record evidence that the North American CPT market differed materially from the rest of the world and the economic analyses summarized above from previous reports, the fact that the horizontal communications relating to CPTs in which Irico allegedly engaged were not directed at North American CPT customers implies that her model does not reliably reflect the impact on IPPs of this conduct.



Margaret E. Guerin-Calvert

March 16, 2022

[66] Willig Surrebuttal Report, ¶ 32.

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EDUCATION

1976	A.B., Economics, Brown University
1979	M.P.A., (Masters in Public Affairs), Princeton School of Public and International Affairs, Princeton University

PROFESSIONAL EXPERIENCE

2012-present	President, Center for Healthcare Economics and Policy and Senior Managing Director, FTI Consulting, Inc.
2012-2/2019	Senior Consultant, Compass Lexecon (continue as Senior Consultant on selected matters)
2008-2012	Vice Chairman and Senior Managing Director, Compass Lexecon (formerly Competition Policy Associates)
2003-2008	President, Competition Policy Associates (As of January 2006, also Senior Managing Director, FTI Consulting Inc.)
1994-2003	Principal, Economists Incorporated
1990-1994	Assistant Chief, Economic Regulatory Section, Economic Analysis Group, Antitrust Division, U.S. Department of Justice
1987-1990	Senior Economist, Economists Incorporated
1986-1987	Director of Analytical Resources Unit, Economic Analysis Group, Antitrust Division
1985-1986	Economist, Economic Analysis Group, Antitrust Division, U.S. Department of Justice

1982-1985	Economist, Financial Structure Section, Division of Research and Statistics, Board of Governors of the Federal Reserve System
1979-1982	Economist, Economic Policy Office, Antitrust Division, U.S. Department of Justice
1976-1977	Research Associate, Energy Economics Group, Arthur D. Little, Inc.

TEACHING EXPERIENCE

1984	Adjunct Lecturer, Sanford School of Public Policy (formerly Institute of Policy Sciences), Duke University
1984-1989	Executive Education for Top State Managers, conducted by The Institute of Policy Sciences, Duke University
1983	Lecturer, Board of Governors of the Federal Reserve System and American Institute of Banking
1979	Teaching Assistant, Princeton University

TESTIMONIES

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"Using Population Health Data for Facility Planning," Presentation at the Canadian Institute, Canadian Healthcare Infrastructure Conference, October 25, 2016.

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"The Determinants of Thrift Institutions' Commercial Lending Activity," *Chicago Bank Structure and Competition Compendium*, September 1983, (with C. Dunham).

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Direct and Rebuttal Testimony in the *Investigation into the Competitive Marketing of Air Transportation*, at the Civil Aeronautics Board, August 1980.

National Benefits/Costs of Enhanced Oil Recovery Research Final Report, Arthur D. Little, Inc., submitted to the Energy Research and Development Administration, August 1976, (with F. Mansvelt-Beck and T. Rothermal)

OTHER PROFESSIONAL ACTIVITIES

Co-Chair, NASEM's Action Collaborative on Business Engagement in Building Healthy Communities

Co-Chair, Imagining Antitrust Law Section 2.0, and Chair, Financial Independence Task Force, Antitrust Law Section, American Bar Association
Associate Member, Section of Antitrust Law, American Bar Association and its Committees, including Healthcare and Pharmaceuticals

Member, American Economics Association

Member, AcademyHealth

Member, American Health Lawyers Association

Member, Brown University – The Warren Alpert Medical School's Advisory Council on Biology and Medicine

Member, NASEM Roundtable on Population Health Improvement

Member, NASEM Business Engagement in Obesity Solutions Innovation Collaborative

PAST PROFESSIONAL ACTIVITIES

Chair, Interagency Task Force on Bank Competition (U.S. DOJ, Antitrust Division)

Co-Chair, Economics Task Force, Member, Technology and Financial Resources Task Force, Chair of the Membership Committee, Transition Task Force Member, Chair of the Exemptions and Immunities Task Force, Council Member, Chair, Financial Markets and Institutions Committee, Member Advisory Board on Section Reserves, International Task Force, Member Long Range Planning Committee, Section of Antitrust Law, American Bar Association

Appendix B – Testimony at Deposition or Trial in the Last Four Years of Margaret E. Guerin-Calvert

Evanston Northwestern Healthcare Corporation Antitrust Litigation, United States District Court Northern District of Illinois Eastern Division, No. 07-CV-4446.

BRFHH Shreveport, L.L.C. d/b/a University Health Shreveport and Vantage Health Plan, Inc., v. Willis-Knighton Medical Center, d/b/a Willis-Knighton Health System, United States District Court Western District of Louisiana Shreveport Division, No. 5:15-CV-02057.

UFCW & Employers Benefit Trust, on behalf of itself and all others similarly situated v. Sutter Health; Sutter East Bay Hospitals; Sutter West Bay Hospitals; Eden Medical Center; Sutter Central Valley Hospitals; Mills-Peninsula Health Services; Sutter Health Sacramento Sierra Region; Sutter Coast Hospital; Palo Alto Medical Foundation for Healthcare, Research, and Education; and Sutter Medical Foundation, Superior Court of the State of California for the City and County of San Francisco, Cas No. CGC-14-538451.

In re: Opana ER Antitrust Litigation, MDL No. 2580, Lead Case No. 14-cv-10150, United States District Court Northern District of Illinois Eastern Division.

In re: In the Matter of Illumina, Inc., a corporation and GRAIL, Inc., a corporation, United States of America Before the Federal Trade Commission Office of Administrative Law Judges, Docket No. 9401, Deposition, August 3, 2021 and Trial Deposition Testimony, September 30, 2021.

Appendix C – Materials Relied Upon by Margaret E. Guerin-Calvert

Legal Filings

Indirect Purchaser Plaintiffs' Fifth Consolidated Amended Complaint, *In re: Cathode Ray Tube (CRT) Antitrust Litigation*, United States District Court Northern District of California San Francisco, September 19, 2019

Expert Materials

Expert Report and backup of Janet S. Netz, Ph.D., April 15, 2014, with Errata, July 3, 2014

Expert Report of Janusz A. Ordover, Ph.D., August 5, 2014

Expert Report of Margaret E. Guerin-Calvert, August 5, 2014

Expert Report and reliance materials of Robert D. Willig, August 5, 2014, with Errata, September 10, 2014 and September 23, 2014

Expert Rebuttal Report and backup of Janet Netz, September 26, 2014

Expert Surrebuttal Report of Margaret E. Guerin-Calvert, November 6, 2014

Expert Surrebuttal Report and reliance materials of Robert D. Willig, November 6, 2014

Expert Report of Donald Clarke, March 16, 2022

Expert Depositions and Exhibits

Deposition of Margaret E. Guerin-Calvert, September 17, 2014

Deposition of Robert D. Willig, September 19, 2014

Depositions and Exhibits

Deposition of Edwin Wolff (PNA), July 18, 2012

Deposition of Jaein Lee (SDI), June 6-7, 2012

Deposition of Jay Heinecke (TAEC), July 31, 2012

Deposition of Michael Son (SDI), February 5-6, 2013

Deposition of Roger de Moor (Philips), July 31 - August 1, 2012

Deposition of Steve Panosian (SEA), July 17, 2012

Deposition of William Whalen (HAL), August 23, 2012

Deposition of Yun Seok Lee (LGE), July 11, 2012

Academic Citations

American Bar Association Section of Antitrust Law, *Proving Antitrust Damages: Legal and Economic Issues*, 2nd ed., ABA Publishing, 2010

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Rubinfeld, Daniel L. (2012), "Antitrust Damages," in Elhauge, Einer, ed. *Research Handbook on the Economics of Antitrust Law*, Edward Elgar, p. 380

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"Dollar Yuan Exchange Rate – 35 Year Historical Chart," Macrotrends, available at <https://www.macrotrends.net/2575/us-dollar-yuan-exchange-rate-historical-chart>

Data

iSuppli Corporation, *Television Systems Market Tracker Q4 2003*

U.S. Census Bureau, Current Industrial Reports - Consumer Electronics, Series MA36M (1995-2000) and MA334M (2001-2006)

Bates-Stamped Documents and Data

MTPD-0416090

SDCRT-0201291

All materials cited in the report, appendices, or backup files to the Guerin-Calvert Expert Reports

Appendix D – Summary of Opinions from Guerin-Calvert Surrebutal Report

35. As noted above, I reaffirm the conclusions and underlying analyses presented in my previous reports in this matter, including my surrebuttal report. The following is the summary of the conclusions presented in that report.

36. In my initial report, I demonstrated that the results of Dr. Netz's overcharge model rely heavily on price increases in 1995 and the resulting high prices in 1995 and 1996 which are not plausibly related to the alleged conspiracy. Dr. Netz's overcharge model is extremely sensitive to the manner in which the indicator variables (dummy variables) for the alleged cartel period are specified. In particular, I demonstrated that Dr. Netz's assumption that the alleged conspiracy resulted in an equal percentage overcharge of 22 percent throughout the entire 12 year period of 1995 through 2006 was inconsistent with: a) CDT industry conditions; b) Dr. Netz's own allegations regarding the alleged conspiracy; and c) econometric analysis of CDT prices.[67]

37. In her rebuttal report and commentary on my economic analyses, Dr. Netz argues that I "overlook the documentary and testimonial evidence related to cartel conduct and effectiveness in 1995 and 1996." In fact, I have fully considered the documentary and testimonial evidence of collusion offered by Dr. Netz, as well as my own, additional extensive review of the factual and economic evidence for 1995 and 1996 in my assessment of her model and overcharge analysis. I have used my analysis for the purpose of making and supporting the economically appropriate and reasonable changes to her model, and presenting alternative overcharge estimates from that for 1995 and 1996 (along with other years). Dr. Netz and I agree that cartel efficacy is an empirical question. Contrary to Dr. Netz's claims, the fundamental question is not whether a given model generates overcharge estimates for 1995 and 1996. Dr. Netz's model and the economically reasonable and appropriate changes I made to her model to better account for underlying market conditions and facts both result in estimated overcharges during these years. Rather, the fundamental

[67] Guerin-Calvert Surrebuttal Report, ¶ 7.

question is what the most appropriate way is to model and estimate the magnitude of overcharges, if any, in light of the available factual and empirical evidence.[68]

38. I believe that the relatively few adjustments I made to Dr. Netz's overcharge model are strongly supported by the underlying economic and factual circumstances in 1995 and 1996 (and indeed in other years) and also by recognized econometric practice. There are at least three separate and widely recognized rationales for the use of multiple dummy variables to estimate cartel overcharges that apply in this matter, and none are diminished by Dr. Netz's reference to any additional documentary and testimony evidence from 1995 and 1996: 1) if the effectiveness of the conspiracy varied over time, 2) if there are important changes in economic conditions affecting prices that are not otherwise captured in the model, and c) if class membership varies over time. The change to include dummy variables for 1995 and 1996 and the other changes better to account for industry conditions and facts that varied over time continue to be economically necessary to produce more economically reasonable approaches to estimate overcharges than those provided by Dr. Netz's model.[69]

39. Dr. Netz argues in her rebuttal report that her overcharge model is "robust to small changes in the model." However, while her estimated overcharges may not change substantially with certain handpicked changes in the model that she herself chose to highlight, they clearly are not robust to other economically reasonable small changes. In fact, as I demonstrated in my initial report, when I relaxed Dr. Netz's arbitrary assumption that overcharges were constant during 1995 through 2006 and allowed the estimated effect to vary over time, the results were dramatically inconsistent with her "robustness" assumption:[70]

a) The estimated overall overcharge declines substantially.[71]

[68] *Id.*, ¶ 8.

[69] *Id.*, ¶ 9.

[70] *Id.*, ¶ 10.

[71] *Id.*, ¶ 10 (first sub-bullet).

b) A large portion of the remaining "overcharge" occurs only in years 1995 and 1996.[72]

c) The overcharge for the great majority of the alleged conspiracy period 1997-2007 is small and not statistically significant.[73]

d) The ability of the model to explain overall changes in CDT prices over time improves significantly.[74]

40. The unreliability of Dr. Netz's overcharge model for estimating damages across the class and across the class period is further demonstrated in this report by the fact that the estimated overcharges for the larger sizes (over 15") of CDTs completely disappear if we simply estimate Dr. Netz's overcharge model separately for different sizes of CDTs. Moreover, this category of larger size CDTs accounts for roughly 65 percent of total CDT sales during the alleged cartel period in Dr. Netz's data.[75]

41. The fact that the overcharge on such a large category of sales disappears with such a reasonable change in the model – splitting the data into two size categories and estimating Dr. Netz's own model separately for each -- further undermines her claim that her estimated overcharges are robust to reasonable changes. It also casts substantial doubt on the proposition that the alleged conspiracy would produce common impact and/or similar overcharges for all sizes of CDTs because there was a reliable and commonly understood "price structure" between and among sizes, for example.[76]

42. Dr. Netz does not assert that any of the variables I added to her model lack economic relevance or are in and of themselves inappropriate. Instead, Dr. Netz argues in her rebuttal report that the additional variables that I added to her model "do not explain materially more of CRT price changes than the variables I [Dr. Netz] use." In contrast, I show in this report that the variables that I added substantially improve the performance of

[72] *Id.*, ¶ 10 (second sub-bullet).

[73] *Id.*, ¶ 10 (third sub-bullet).

[74] *Id.*, ¶ 10 (fourth sub-bullet).

[75] *Id.*, ¶ 11.

[76] *Id.*, ¶ 12.

her model based both on economic logic and on widely recognized econometric criteria, as well as substantially reducing overcharges.[77]

43. In my initial report, I used financial information from several defendants to make two primary points: 1) Defendants' profit margins showed no significant increase at the beginning of the alleged conspiracy despite Dr. Netz's claim that prices were effectively increased substantially and anticompetitively at that point in time; and 2) Dr. Netz's estimated overcharges imply that most defendants would have incurred substantially lower profitability in the but-for world than they experienced in the actual world, including large losses for an extended period of time. In this report I demonstrate that these conclusions are not affected by the criticisms made by Dr. Netz in her rebuttal report.[78]

44. I also explain that such losses likely would have led some of the defendants to reduce the level of investment below what they had invested in the actual world, and in some cases may have caused firms to exit the industry earlier than they did in the actual world. Dr. Netz failed to consider any of these potential consequences of her large assumed overcharges on manufacturer incentives in her expert report filed on April 15, 2015. Similarly, her attempts to dismiss them in her rebuttal report are not convincing.[79]

45. In her rebuttal report, Dr. Netz made a number of other criticisms of my initial report. I respond to these arguments in this report. As described in more detail below, none of the additional arguments or analyses offered by Dr. Netz have caused me to change my opinions.[80]

[77] *Id.*, ¶ 13.

[78] *Id.*, ¶ 14.

[79] *Id.*, ¶ 15.

[80] *Id.*, ¶ 16.

Appendix E – Summary of Opinions from Willig Surrebuttal Report

46. As noted above, I have considered and assessed independently and concur with the conclusions and underlying analyses presented in the expert reports that Professor Willig has previously submitted in this matter, including his surrebuttal report. The following is the summary of the conclusions presented in that report.

47. "In my initial damages report, I explained that Dr. Netz's estimates of CPT overcharges are fundamentally unreliable because the model that she uses to estimate them does not properly control for changes in market conditions (such as changes in product quality) and because the model is unstable. As a result of these flaws, the overcharge estimated by Dr. Netz cannot distinguish between the price impact of changes in market conditions during the relevant period and any alleged impact of the putative cartel. Dr. Netz does not dispute this in her rebuttal report."[81]

48. "In my initial damages report I further explained that if, despite these fundamental flaws, Dr. Netz's model were to be used to estimate CPT overcharges, then her model should be modified to better control for changes in market conditions. Making reasonable modifications to her model (in the same spirit as her approach) to include relevant economic variables and to better control for changes in market conditions results in substantially smaller estimates of CPT overcharges than Dr. Netz's estimates. In her rebuttal report, Dr. Netz does not dispute that my inclusion of these additional market controls is consistent with economic reasoning, nor does she dispute that their inclusion in her model (but making no other changes to it) substantially reduces estimated overcharges."[82]

49. "Dr. Netz contends in her rebuttal report that it is unnecessary to add the market variables that I employ because her model without these variables already explains a high proportion of the variation in CPT prices and because these variables do not substantially improve the ability of her model to explain CPT price variation. However, the purpose of

[81] Willig Surrebuttal Report, ¶ 7(a).

[82] *Id.*, ¶ 7(b).

an overcharge model is not to explain CPT prices for its own sake, but rather to reliably determine the influence that the alleged cartel's activities had on CPT prices. My empirical findings demonstrate that much of the effect that Dr. Netz's model attributed to the cartel was, in fact, the influence that these omitted variables had on CPT prices. This showing is backed by the solid economic rationale for including these variables in Dr. Netz's CPT pricing model and by the fact that the data show they had a jointly statistically significant impact on CPT prices."[83]

50. "When estimating overcharges, Dr. Netz assumes without support that the overcharge is uniform during the 12-year period between 1995 and 2006. I demonstrated in my initial damages report that removing this assumption and permitting overcharges to vary across years shows that there were no statistically significant overcharges after 1996. Moreover, it shows the average annual overcharge between 1995 and 2006 was far less than the overcharge estimated by Dr. Netz. In her rebuttal report, Dr. Netz provides no valid economic argument against the annual overcharge analysis. She just claims that I have provided no reasons to expect overcharges to vary across years during the Class Period. However, this is plainly incorrect since I have explained at length that market conditions changed considerably during the class period and the impact of the alleged cartel was consequently unlikely to have been uniform, contrary to Dr. Netz's assumption."[84]

51. "In my initial damages report, I demonstrated that Dr. Netz's model estimates an overcharge for large CPTs that is statistically indistinguishable from zero, whereas the same model estimates a statistically significant overcharge for smaller CPTs. Dr. Netz does not dispute this finding in her rebuttal report. Nonetheless, Dr. Netz contends that because the overcharge for large CPTs estimated by her model is positive and because this estimate is the "best estimate" produced by her analysis, then even if it is not statistically significant, it follows that her analysis proves the alleged cartel impacted prices of large CPTs. However, when Dr. Netz's model is modified modestly to better control for changes in relevant market conditions, while still reflecting her modeling approach, the model

[83] *Id.*

[84] *Id.*, ¶ 7(c).

estimates negative overcharges for large CPTs, whereas the same model estimates positive and statistically significant overcharges for small CPTs. I conclude that Dr. Netz's approach to estimating overcharges is therefore unable to establish that purchasers of large CPTs were impacted by the alleged cartel." [85]

52. "In my initial damages report, I showed that when Dr. Netz's model of CPT overcharges is applied to CPTs sold in North America, her model estimates substantially smaller percentage overcharges for North American CPT sales than for global CPT sales. Dr. Netz contends that my estimates of North American CPT overcharges are not statistically distinguishable from her estimates of global CPT overcharges. However, the difference between them is economically important because it leads to a substantial difference in the estimated percentage overcharge. Furthermore, when minor modifications are made to Dr. Netz's overcharge model in order to control for North American market conditions (modifications that are entirely in the spirit of Dr. Netz's analysis), the model estimates overcharges in North America that are even smaller and statistically (and economically) distinguishable from Dr. Netz's estimate of global overcharges."[86]

53. "I explained in my initial damages report that Chunghwa's profit margins did not increase following the start of the alleged cartel in 1995, and this is inconsistent with Plaintiffs' claim of a highly effective cartel. In her rebuttal report, Dr. Netz contends that my measure of Chunghwa's profit margins improperly included the cost of asset depreciation. However, removing such costs both before and after 1995 does not alter my conclusion, i.e., there is no evidence that Chunghwa's profit margins increased after 1995. Dr. Netz makes several further arguments related to Chunghwa's profits, but none have any merit."[87]

54. "The observed heterogeneity of price dynamics among CPTs indicates that there were substantially heterogeneous market forces impacting the prices of various CPTs

[85] *Id.*, ¶ 7(d).

[86] *Id.*, ¶ 7(e).

[87] *Id.*, ¶ 7(f).

during the Class Period, and the presence of such market heterogeneity is inconsistent with the "price structure" claimed by Dr. Netz."[88]

55. "In my initial damages report, I demonstrated that the alleged cartel members' conduct was inconsistent with a sustained and effective CPT cartel, and in particular, that the alleged cartel members frequently deviated from the alleged target CPT prices. Dr. Netz asserts that one of my analyses of actual and target CPT prices is sensitive to the presence of data noise. However, she provides no empirical evidence that data noise presents a material issue. In contrast, I demonstrate empirically that her methodology for analyzing actual and target CPT prices is biased towards finding that cartel members adhered to the alleged target prices and therefore is incapable of distinguishing competitive outcomes from effective collusion."[89]

[88] *Id.*, ¶ 7(g).

[89] *Id.*, ¶ 7(h).

Appendix F – Impact on IPP Damages Estimates Assuming Irico Did Not Particpate in the Alleged Cartel Prior to August 1998

Table F-1 – Dr. Netz's IPP Damages Estimates for March 1, 1995 to November 27, 2007

Year	CDT			CPT		
	Volume of Commerce	Overcharge	Damages	Volume of Commerce	Overcharge	Damages
1995	$988,089,193	22.0%	$217,562,196	$653,493,012	9.0%	$58,894,187
1996	$1,356,003,782	22.0%	$298,571,387	$868,226,645	9.0%	$78,246,441
1997	$1,199,479,732	22.0%	$264,107,175	$855,082,565	9.0%	$77,061,869
1998	$979,057,154	22.0%	$215,573,479	$821,166,215	9.0%	$74,005,255
1999	$1,199,474,354	22.0%	$264,105,990	$797,915,860	9.0%	$71,909,883
2000	$1,315,079,864	22.0%	$289,560,564	$815,569,045	9.0%	$73,500,826
2001	$698,437,830	22.0%	$153,785,376	$691,212,798	9.0%	$62,293,575
2002	$585,233,722	22.0%	$128,859,555	$626,420,387	9.0%	$56,454,344
2003	$339,742,118	22.0%	$74,806,042	$618,275,442	9.0%	$55,720,304
2004	$322,914,610	22.0%	$71,100,881	$639,125,159	9.0%	$57,599,326
2005	$153,611,074	22.0%	$33,822,820	$484,044,628	9.0%	$43,623,137
2006	$56,079,170	22.0%	$12,347,779	$334,449,470	9.0%	$30,141,301
2007	$15,622,368	11.4%	$1,780,923	$102,641,804	3.1%	$3,179,262
Total	**$9,208,824,971**	**22.0%**	**$2,025,984,167**	**$8,307,623,030**	**8.9%**	**$742,629,709**

Sources: Netz Report, Netz Report Errata

Table F-2 – Dr. Netz's IPP Damages Estimates for August 1, 1998 to November 27, 2007

Year	CDT			CPT		
	Volume of Commerce	Overcharge	Damages	Volume of Commerce	Overcharge	Damages
1995	$0	22.0%	$0	$0	9.0%	$0
1996	$0	22.0%	$0	$0	9.0%	$0
1997	$0	22.0%	$0	$0	9.0%	$0
1998	$479,307,821	22.0%	$105,536,285	$337,815,463	9.0%	$30,444,652
1999	$1,199,474,354	22.0%	$264,105,990	$797,915,860	9.0%	$71,909,883
2000	$1,315,079,864	22.0%	$289,560,564	$815,569,045	9.0%	$73,500,826
2001	$698,437,830	22.0%	$153,785,376	$691,212,798	9.0%	$62,293,575
2002	$585,233,722	22.0%	$128,859,555	$626,420,387	9.0%	$56,454,344
2003	$339,742,118	22.0%	$74,806,042	$618,275,442	9.0%	$55,720,304
2004	$322,914,610	22.0%	$71,100,881	$639,125,159	9.0%	$57,599,326
2005	$153,611,074	22.0%	$33,822,820	$484,044,628	9.0%	$43,623,137
2006	$56,079,170	22.0%	$12,347,779	$334,449,470	9.0%	$30,141,301
2007	$15,622,368	11.4%	$1,780,923	$102,641,804	3.1%	$3,179,262
Total	**$5,165,502,931**	**22.0%**	**$1,135,706,215**	**$5,447,470,056**	**8.9%**	**$484,866,609**

Sources: Netz Report backup, Netz Report Errata

Note: The volume of commerce and damages estimates for 1998 reflect the August to December 1998 period only. Specifically, these estimates represent the sum of Dr. Netz's volume of commerce estimates for Q4 1998 and a pro-rated share (61/92) of her volume of commerce estimates for Q3 1998.

Table F-3 – IPP Damages Estimates for March 1, 1995 to November 27, 2007 when Making Economically Appropriate Corrections to Dr. Netz's Overcharge Model

Year	CDT			CPT		
	Volume of Commerce	Overcharge	Damages	Volume of Commerce	Overcharge	Damages
1995	$988,089,193	1.6%	$15,365,327	$653,493,012	2.3%	$15,010,094
1996	$1,356,003,782	1.6%	$21,086,601	$868,226,645	2.3%	$19,942,315
1997	$1,199,479,732	1.6%	$18,652,566	$855,082,565	2.3%	$19,640,409
1998	$979,057,154	1.6%	$15,224,874	$821,166,215	2.3%	$18,861,383
1999	$1,199,474,354	1.6%	$18,652,482	$797,915,860	2.3%	$18,327,345
2000	$1,315,079,864	1.6%	$20,450,211	$815,569,045	2.3%	$18,732,822
2001	$698,437,830	1.6%	$10,861,090	$691,212,798	2.3%	$15,876,481
2002	$585,233,722	1.6%	$9,100,704	$626,420,387	2.3%	$14,388,262
2003	$339,742,118	1.6%	$5,283,176	$618,275,442	2.3%	$14,201,181
2004	$322,914,610	1.6%	$5,021,499	$639,125,159	2.3%	$14,680,079
2005	$153,611,074	1.6%	$2,388,736	$484,044,628	2.3%	$11,118,031
2006	$56,079,170	1.6%	$872,062	$334,449,470	2.3%	$7,681,977
2007	$15,622,368	0.0%	$0	$102,641,804	0.0%	$0
Total	**$9,208,824,971**	**1.6%**	**$142,959,329**	**$8,307,623,030**	**2.3%**	**$188,460,378**

Sources: Netz Report backup, Guerin-Calvert Report, Willig Report

Table F-4 – IPP Damages Estimates for August 1, 1998 to November 27, 2007 when Making Economically Appropriate Corrections to Dr. Netz's Overcharge Model

Year	CDT			CPT		
	Volume of Commerce	Overcharge	Damages	Volume of Commerce	Overcharge	Damages
1995	$0	1.6%	$0	$0	2.3%	$0
1996	$0	1.6%	$0	$0	2.3%	$0
1997	$0	1.6%	$0	$0	2.3%	$0
1998	$479,307,821	1.6%	$7,453,499	$337,815,463	2.3%	$7,759,290
1999	$1,199,474,354	1.6%	$18,652,482	$797,915,860	2.3%	$18,327,345
2000	$1,315,079,864	1.6%	$20,450,211	$815,569,045	2.3%	$18,732,822
2001	$698,437,830	1.6%	$10,861,090	$691,212,798	2.3%	$15,876,481
2002	$585,233,722	1.6%	$9,100,704	$626,420,387	2.3%	$14,388,262
2003	$339,742,118	1.6%	$5,283,176	$618,275,442	2.3%	$14,201,181
2004	$322,914,610	1.6%	$5,021,499	$639,125,159	2.3%	$14,680,079
2005	$153,611,074	1.6%	$2,388,736	$484,044,628	2.3%	$11,118,031
2006	$56,079,170	1.6%	$872,062	$334,449,470	2.3%	$7,681,977
2007	$15,622,368	0.0%	$0	$102,641,804	0.0%	$0
Total	**$5,165,502,931**	**1.6%**	**$80,083,460**	**$5,447,470,056**	**2.3%**	**$122,765,467**

Sources: Netz Report backup, Guerin-Calvert Report, Willig Report

Note: The volume of commerce and damages estimates for 1998 reflect the August to December 1998 period only. Specifically, these estimates represent the sum of Dr. Netz's volume of commerce estimates for Q4 1998 and a pro-rated share (61/92) of her volume of commerce estimates for Q3 1998.

Appendix G – Estimates of Dr. Netz's Volume of Commerce and Damages Estimates for CPTs with a Diameter Larger than 29 Inches

Table G-1 – Estimates of Dr. Netz's Volume of Commerce and Damages Estimates for CPTs with a Diameter Larger than 29 Inches

Year	Volume of Commerce	Overcharge	Damages
1995	$163,740,665	9.0%	$14,756,659
1996	$255,053,624	9.0%	$22,985,978
1997	$248,597,310	9.0%	$22,404,122
1998	$266,157,523	9.0%	$23,986,686
1999	$133,285,662	9.0%	$12,011,989
2000	$153,026,482	9.0%	$13,791,074
2001	$126,289,276	9.0%	$11,381,460
2002	$133,098,994	9.0%	$11,995,166
2003	$118,465,939	9.0%	$10,676,404
2004	$102,388,972	9.0%	$9,227,513
2005	$59,718,493	9.0%	$5,381,958
2006	$30,897,806	9.0%	$2,784,576
2007	$8,264,274	3.1%	$255,980
Total	**$1,798,985,020**	**9.0%**	**$161,639,565**

Sources: Netz Report backup, Netz Report Errata

Notes: (i) The volume of commerce estimates in the above table were derived by summing Dr. Netz's estimate of the volume of commerce for each CPT size larger than 29 inches (found in Dr. Netz's backup file, "total_damages.dta"). (ii) These volume of commerce estimates were then multiplied by Dr. Netz's overcharge estimate to obtain an estimate of the value of her damages estimates associated with CPTs larger than 29 inches.

Table G-2 – Estimates of Dr. Netz's Volume of Commerce for CPTs with a Diameter Larger than 29 Inches and the Resulting Damages Estimates when Making Economically Appropriate Corrections to Dr. Netz's Overcharge Model

Year	Volume of Commerce	Overcharge	Damages
1995	$163,740,665	2.3%	$3,760,963
1996	$255,053,624	2.3%	$5,858,332
1997	$248,597,310	2.3%	$5,710,037
1998	$266,157,523	2.3%	$6,113,377
1999	$133,285,662	2.3%	$3,061,441
2000	$153,026,482	2.3%	$3,514,868
2001	$126,289,276	2.3%	$2,900,741
2002	$133,098,994	2.3%	$3,057,153
2003	$118,465,939	2.3%	$2,721,047
2004	$102,388,972	2.3%	$2,351,774
2005	$59,718,493	2.3%	$1,371,675
2006	$30,897,806	2.3%	$709,692
2007	$8,264,274	0.0%	$0
Total	**$1,798,985,020**	**2.3%**	**$41,131,101**

Sources: Netz Report backup, Netz Report Errata

Notes: (i) The volume of commerce estimates in the above table were derived by summing Dr. Netz's estimate of the volume of commerce for each CPT size larger than 29 inches (found in Dr. Netz's backup file, "total_damages.dta"). (ii) These volume of commerce estimates were then multiplied by the overcharge estimate that is obtained by applying the same economically appropriate corrections described and applied by Professor Willig in his 2014 reports to Dr. Netz's CPT overcharge model.

Appendix H - Domestically-Produced Share of U.S. TV Purchases

Year	Domestic Shipments ($1000s)	Exports ($1000s)	Imports ($1000s)	Domestically-Produced Share of U.S. TV Purchases
1995	$5,130,453	N/A	$2,633,365	N/A
1996	$4,653,300	$325,420	$3,762,002	53.5%
1997	$4,185,761	$410,482	$3,522,082	51.7%
1998	$3,764,197	$616,636	$4,872,773	39.2%
1999	$4,317,057	$183,032	$4,103,913	50.2%
2000	$3,970,366	$157,830	$4,579,084	45.4%
2001	$3,038,969	$161,848	$5,305,606	35.2%
2002	$3,284,882	$105,964	$6,480,435	32.9%
2003	$3,827,744	$100,421	$6,278,911	37.3%
2004	$3,763,428	$144,361	$5,463,320	39.8%
2005	$3,835,563	$120,482	$12,892,874	22.4%
2006	$3,429,482	$120,482	$4,735,874	41.1%
Total (1996-2006)	**$42,070,749**	**$2,446,958**	**$61,996,874**	**39.0%**
Total (1996-2002)	**$27,214,532**	**$1,961,212**	**$32,625,895**	**43.6%**

Sources: Current Industrial Reports - Consumer Electronics, U.S. Census, Series MA36M (1995-2000) and MA334M (2001-2006).

Notes: (i) The domestically-produced share of U.S. TV purchases in a given year equals: (domestic shipments - exports) / (domestic shipments + imports - exports). (ii) The numbers in the table are for all TVs (not just CRT TVs) as the U.S. Census data do not provide separate estimates for CRT TVs. However, from 1996 through 2002, LCD and plasma TVs accounted for less than 1% of North American TV purchases (Television Systems Market Tracker Q4 2003, iSuppli Corporation). (iii) Export data are unavailable for 1995.

EXHIBIT 13

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

IN RE: CATHODE RAY TUBE (CRT) ANTITRUST LITIGATION	No. 3:07-cv-05944-SC MDL No. 1917
This Document Relates to:	
ALL ACTIONS	

HIGHLY CONFIDENTIAL

VIDEOTAPED DEPOSITION OF JANET S. NETZ, PH.D.

San Francisco, California

Friday, June 27, 2014

REPORTED BY:

LESLIE ROCKWOOD, RPR, CSR 3462

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

IN RE: CATHODE RAY TUBE (CRT) ANTITRUST LITIGATION

This Document Relates to:

ALL ACTIONS

No. 3:07-cv-05944-SC
MDL No. 1917

Videotaped deposition of JANET S. NETZ, PH.D., taken on behalf of the Defendants, at Zelle Hofmann Voelbel & Mason LLP, 44 Montgomery Street, Suite 3400, San Francisco, California, beginning at 9:02 A.M. and ending at 4:40 P.M. on Friday, June 27, 2014, before Leslie Rockwood, RPR, Certified Shorthand Reporter No. 3462.

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Also Present: Sean Grant, Videographer

--oOo--

A. No, I did not.

Q. Do you know if any of them calculated overcharges on a year-by-year basis or a shorter basis?

A. I believe some calculated overcharges on a quarterly basis. 09:26:28

Q. Okay. And do you think that that's an unreasonable approach given the conspiracy in this case that's been alleged?

MS. WHITEHEAD: Object to form.

THE WITNESS: I haven't looked at what they did specifically. I'm aware of the general approach that they took and their using commonly used, accepted economic approaches. But aside from saying that the approach that they used is generally acceptable -- generally accepted, I don't have a further opinion because I'm not familiar with their -- the details of their studies. 09:26:38 09:26:57

Q. BY MR. KESSLER: Okay. So then you agree that you could use generally accepted economic techniques to calculate the overcharges in this case on a shorter period basis than 2006 to 1995 all averaged together; right? 09:27:11

MR. ALIOTO: Object as to form.

THE WITNESS: That is correct. My testimony is not that my way is the only economically reasonable way

EXHIBIT 14

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

IN RE: CATHODE RAY TUBE (CRT) ANTITRUST LITIGATION	No. 3:07-cv-05944-SC MDL No. 1917
This Document Relates to:	
ALL ACTIONS	

HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY

VIDEO-RECORDED DEPOSITION OF

YU-HAO ZHANG, A/K/A ALLEN CHANG

San Francisco, California

March 12, 2014

Reported by:
KENNETH T. BRILL
CSR NO. 12797

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

IN RE: CATHODE RAY TUBE (CRT) ANTITRUST LITIGATION	No. 3:07-cv-05944-SC MDL No. 1917
This Document Relates to:	
ALL ACTIONS	

HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY

Video-recorded Deposition of YU-HAO ZHANG, A/K/A ALLEN CHANG, Volume 1, taken on behalf of Direct Action Plaintiffs, at Zelle Hoffman Voelbel & Mason LLP, 44 Montgomery Street, Suite 3400, San Francisco, CA, beginning at 9:39 a.m., and ending at 4:14 p.m., on Wednesday, March 12, 2014, before KENNETH T. BRILL, Certified Shorthand Reporter No. 12797.

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Yang Shao, Check Interpreter
Cassia Leet, Videographer

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San Francisco, California, Wednesday March 12, 2014

9:39 a.m.

THE VIDEOGRAPHER: Good morning. We are on the record at 9:39 a.m. on March 12th, 2014. This is the videoed recorded deposition of Yu-Hao Zhang, a/k/a Allen Chang. 09:39:34 09:39:36 09:39:40 09:39:43

My name is Cassia Leet, here with our court reporter, Ken Brill. We are here from Veritext Legal Solutions at the request of counsel for plaintiff. 09:39:45 09:39:49 09:39:51

This deposition is being held at 44 Montgomery Street, Suite 3400, San Francisco, California 94104. 09:39:57 09:39:58

The caption of this case is, In Re: Cathode Ray Tubes, CRT Antitrust Litigation, in the United States District Court, Northern District of California, San Francisco Division, Master File No. 075944-SC. 09:40:08 09:40:12 09:40:15 09:40:17

Please note that audio and video recording will take place unless all parties agree to go off the record. Microphones are sensitive and may pick up whispers, private conversations and cell phone interference. 09:40:23 09:40:27 09:40:30 09:40:32 09:40:36

I am not related to any party in this action, nor am I financially interested in the outcome in any way. If there are any objections to the proceeding, 09:40:36 09:40:38 09:40:40

please state them at the time of your appearance, beginning with the noticing attorney. 09:40:45 09:40:47

MR. ROSS: Jonathan Ross, Susman Godfrey, for Circuit City Liquidating Trust and generally for the Direct Action Plaintiffs. 09:40:51 09:40:58 09:41:00

MS. ZAHID: Judith Zahid, from Zelle Hoffman, for the indirect purchaser plaintiffs. 09:41:02 09:41:02

MS. FU: Quianwei Fu, from Zelle Hoffman, for the indirect purchaser plaintiffs. 09:41:06 09:41:06

MR. MOORE: Paul Moore for the State of California. 09:41:10 09:41:12

MR. FUJITA: Christine Fujita at Gibson Dunn & Crutcher on behalf of Chunghwa Picture Tubes. 09:41:13 09:41:13

MR. CUNNINGHAM: Tyler Cunningham, Shepherd Mullin Richter & Hampton, Samsung SDI defendants. 09:41:17 09:41:19

MR. GAWLEY: Michael Gawley with Kirkland & Ellis for Hitachi Limited, Hitachi Asia Limited, Hitachi America Limited, Hitachi Electronic Devices USA, and Hitachi Displays Limited. 09:41:23 09:41:25 09:41:28 09:41:34

MR. MALAISE: Charles Malaise, Baker Botts, on behalf of the Philips Defendants. 09:41:38 09:41:40

MS. KENNEDY: Meaghan Thomas-Kennedy, Weil Gotshal & Manges, on behalf of the Panasonic Defendants. 09:41:40 09:41:40

MR. YOHAI: David Yohai, Weil, Gotshal & Manges, on behalf of the Panasonic defendants and the 09:41:45 09:41:47

witness. 09:41:49

THE VIDEOGRAPHER: Thank you. The interpreter 09:41:51
and the witness will be sworn in and counsel can begin 09:41:57
the examination. 09:41:58

Whereupon, Certified Court 09:41:58
Interpreter MIMI S. J. LAIN, and Check 09:41:58
Interpreter YANG SHAO, were duly sworn 09:41:58
to interpret from English to Mandarin 09:41:58
and Mandarin to English. 09:41:58

YU-HAO ZHANG, A/K/A ALLEN CHANG, 09:42:27
after having been first duly sworn, was 09:42:27
examined and testified as follows: 09:42:27

09:42:27

EXAMINATION 09:42:21

BY MR. ROSS: 09:42:23

Q. Good morning, Mr. Chang. Would you please 09:42:25
state your name for the record? 09:42:27

A. Allen Chang. 09:42:30

Q. Okay. And is that the name you go by when you 09:42:32
are conducting bus- -- business in English? 09:42:34

A. Yes. 09:42:43

Q. Okay. And when you're conducting business in 09:42:43
Chinese, what name do you go by? 09:42:45

A. Yu-Hao Zhang. 09:42:58

Q. Any other names that you go by when you're 09:43:00

conducting business generally? 09:43:02

A. No. 09:43:06

Q. Have you been deposed before, sir? 09:43:10

A. No. 09:43:13

Q. Has your counsel explained to you -- yes or no question. Has your counsel explained to you what it means to give a deposition in the United States? 09:43:15 09:43:17 09:43:19

A. Yes. 09:43:34

Q. Do you realize, sir, that even though we're in a conference room in an office today, you're giving testimony as the same as if you were giving testimony in a court of law? 09:43:36 09:43:38 09:43:40 09:43:43

A. I know. 09:43:57

Q. And do you understand the oath that you just took to start this deposition? 09:43:57 09:43:58

A. Yes, I do. 09:44:04

Q. Do you understand that you've sworn to tell the truth today? 09:44:06 09:44:08

A. Yes. 09:44:12

Q. And do you understand that the penalties of perjury apply if you don't tell the truth? 09:44:12 09:44:15

A. I know. 09:44:21

Q. Is there anything at all medically or otherwise that would prevent you from testifying truthfully today? 09:44:23 09:44:25 09:44:27

A. No. 09:44:36

Q. And you understand that we are both recording you by video as well as the court reporter who is taking down my questions and your answers? 09:44:36 09:44:40 09:44:43

A. I know. 09:44:58

Q. And while we're off to a great start, if you would please allow me to finish my question, and allow the interpreter to finish the interpretation of that question before you start your answer, even if you know where I'm going, I will try to do the same for you, sir. Is that agreeable? 09:45:00 09:45:02 09:45:04 09:45:06 09:45:10 09:45:12

A. Okay. 09:45:32

Q. If you don't understand any of my questions, would you please ask me to clarify or repeat the question so that we can be sure when you give an answer that you understood what I was asking? 09:45:32 09:45:34 09:45:38 09:45:40

A. Okay. 09:46:02

Q. From time to time either your counsel or other counsel at the table may object to some of my questions. And when they do, that is fine, but then you should go ahead and answer the question unless your counsel has instructed you not to answer. 09:46:02 09:46:04 09:46:06 09:46:10 09:46:12

Do you understand that, sir? 09:46:13

A. I know. 09:46:28

Q. If at any time you need to take a break, sir, 09:46:30

I'm more than happy to take that break, just let me know. Okay, sir? 09:46:32 09:46:36

A. All right. 09:46:45

Q. The only thing I would ask is that if there is a question pending, if I've asked you a question, would you please answer it, sir, before you ask to take a break. 09:46:47 09:46:49 09:46:57 09:46:58

A. Okay. 09:47:10

Q. I asked earlier if you'd ever taken a deposition or had your deposition taken and you said no. Have you ever given testimony of any kind, for example, in a court in China or Japan or here in the United States? 09:47:10 09:47:12 09:47:13 09:47:17 09:47:21

A. Testify? No. 09:47:40

Q. Have you ever been interviewed by any governmental personnel or agencies? 09:47:42 09:47:43

A. No. 09:47:58

Q. Okay. Do you speak English, sir? 09:47:58

A. I rarely use it. 09:48:04

Q. Mm-hmm. Do you -- when you do use it, do you use it in a business setting? 09:48:08 09:48:12

A. For customers, when I deal with Japanese customers, yes. 09:48:23 09:48:28

When I work with the Taiwanese customers, I will use Chinese. 09:48:32 09:48:34

Q. Just so I understand, when you work with Japanese customers, you speak English in those meetings? 09:48:36 09:48:40

A. We don't have customers in Japan; however, we do have the headquarter in Japan. 09:48:58 09:49:04

Q. Okay. When you -- we'll get to your job and who you work for, but generally speaking, when you're speaking with somebody in -- in your company who speaks Japanese, do you use English generally to conduct those conversations? 09:49:06 09:49:10 09:49:13 09:49:17 09:49:21

A. Yes. 09:49:40

Q. Do you read English at all? 09:49:42

A. Yes. 09:49:45

Q. And do you write in English at all? 09:49:45

A. Yes, I do write some. 09:49:57

Q. Other than Chinese or English, do you speak any other languages? 09:49:58 09:50:00

A. Little bit of Japanese. 09:50:08

Q. Okay. Have you ever taken any classes to learn English? 09:50:10 09:50:15

A. From junior high, senior high and college. 09:50:19

Q. Okay. Are you comfortable using English in your business communications with your colleagues at Matsushita? 09:50:27 09:50:28 09:50:32

A. Little bit of difficulties. 09:50:42

Q. Do you use English or Japanese more in those 09:50:43

conversations with your business colleagues at Matsushita? 09:50:45 09:50:47

A. More English. 09:51:02

Q. And as we've been talking for five minutes or so, have you understood my questions in English even without the interpretation? 09:51:02 09:51:06 09:51:08

MR. YOHAI: Objection to the form of the question. 09:51:10 09:51:10

THE WITNESS: I could not understand it very well. 09:51:25 09:51:27

BY MR. ROSS: 09:51:27

Q. Did you meet with counsel to prepare for this deposition? 09:51:27 09:51:30

A. With David and Meaghan. 09:51:38

Q. And how many days did you meet with David and Meaghan? 09:51:40 09:51:45

A. One and a half days. 09:51:45

Q. And was that this week? 09:51:47

A. Yes. 09:51:51

Q. Had you met with them before the -- this week? 09:51:57

A. No. 09:52:04

Q. Had you prepared for this deposition with anyone else before meeting with Meaghan and David this week? 09:52:04 09:52:04 09:52:08

A. My personal attorney. 09:52:15

Q. Okay. Is your personal attorney attending this deposition? 09:52:19 09:52:21

A. No. 09:52:27

Q. Was this meeting in Taiwan? 09:52:27

A. No, in the United States. 09:52:30

Q. When did you -- 09:52:32

A. Right here. 09:52:32

Q. Sure, sorry. 09:52:34

When did you meet with your personal attorney? 09:52:34

A. Monday. 09:52:40

Q. Okay. About how long did you meet with him? 09:52:42

A. Also one and a half days. 09:52:45

Q. Was your personal attorney attending the prep sessions that you had with Panasonic's lawyers? 09:52:49 09:52:57

A. Only half a day. 09:53:13

Q. Okay. Just so I'm clear, did you ever meet with your personal attorney separate from your meetings with the Panasonic lawyers? 09:53:15 09:53:17 09:53:19

A. Yes. 09:53:30

Q. About how long did you meet with your personal attorney separate from your meetings with Panasonic attorneys? 09:53:30 09:53:32 09:53:36

A. About, not even a half a day, a few hours. 09:53:47

Q. Okay. And about how many hours in total did you meet with the Panasonic attorneys? 09:53:51 09:53:57

A. Well, do you mean how many hours? 09:54:12

Q. I do. 09:54:13

A. About ten plus hours. 09:54:30

Q. When you met with your personal attorney, was that meeting conducted in English, Chinese, or was an interpreter used? 09:54:32 09:54:34 09:54:38

A. The entire duration I had an Chinese interpreter present. 09:54:47 09:54:51

Q. By "entire duration" are you saying both when you met with your personal attorney and when you met with the Panasonic attorneys who are here defending you today? 09:54:57 09:55:00 09:55:02 09:55:06

A. Excuse me, I didn't understand it. 09:55:17

Q. Okay. Let me rephrase. When you met with the Panasonic attorneys, was an interpreter present during that time? 09:55:19 09:55:23 09:55:27

A. Yes. 09:55:30

Q. While I appreciate that an interpreter was present, were some questions just conducted in English and others interpreted, or was everything interpreted? 09:55:32 09:55:36 09:55:38

A. Everything was interpreted. 09:56:00

Q. Thank you, sir. What I'd like to do now is talk a little bit about your education. 09:56:02 09:56:04

First off, where were you born? 09:56:10

A. Taipei. 09:56:13

Q. And have you generally lived in Taipei all your life? 09:56:15 09:56:17

A. Yes. 09:56:21

Q. Can you just give us a general sense of your background, education wise, through college, please. 09:56:23 09:56:27

A. Education background, you mean you want me to tell you since elementary school? 09:56:42 09:56:45

Q. Why don't we start with high school and move on. 09:56:47 09:56:51

A. Three years of high school. I studied physics as a major in college. I worked two years as a military volunteer. The first job I had was working for a semiconductor -- semiconductor agent. 09:56:57 09:57:02 09:57:19 09:57:34

Q. Okay. Let me stop you there, sir. Before we get to your jobs, I want to make sure I understand all of your education. 09:57:42 09:57:47 09:57:49

Have you had any post-graduate education after college? 09:58:00 09:58:02

A. No. 09:58:08

Q. No professional degrees? 09:58:08

A. No. 09:58:15

Q. You said that your major was physics. Do you have a background in engineering? 09:58:15 09:58:17

A. Engineering background? What do you mean? Because when I studied physics, you'll have to have an 09:58:30 09:58:36

engineering background. That is an engineering background. 09:58:40 09:58:43

Q. Okay. Do you have any -- did you take business courses? 09:58:45 09:58:46

A. No. 09:58:57

Q. Take any legal courses? 09:58:57

A. No. 09:59:00

Q. Did you take any courses in economics? 09:59:02

A. No. 09:59:08

Q. While you have worked for the various companies that you've worked for, have you done any sort of continuing educational courses of any type? 09:59:10 09:59:12 09:59:13

A. No. 09:59:28

Q. What year did you graduate from college? 09:59:28

A. 1989. 09:59:40

Q. And did you leave the military in 1991? 09:59:45

A. Yes. 09:59:51

Q. And you said that your first job was at a semiconductor agent. What was the name of that company? 09:59:57 10:00:02

A. It was a semiconductor device or supplies -- or equipment company. I don't recall the name because I worked there less than six months. 10:00:21 10:00:27 10:00:30

Q. Was this -- these six months in 1991, or did it bleed over into 1992? 10:00:32 10:00:36

A. I think it was in 1991, I think. 10:00:47

Q. That's fine. And as we go through the questions today, the best I can get is your recollection. I understand that some of these events are from a long time ago. So just give me your best recollection and if you don't recall, we'll move on. 10:00:57 10:00:58 10:01:00 10:01:02 10:01:06

A. Okay. 10:01:28

Q. What was your position at the semiconductor company? 10:01:28 10:01:30

A. Service engineer. 10:01:40

Q. And what exactly did that job entail, what did you do? 10:01:42 10:01:45

A. Few of my job duties included maintenance and repairs of the equipment. Also, I sold some service parts. 10:01:58 10:02:02 10:02:13

Q. Did you say you sell? 10:02:15

A. Yes, I had to build some of the business in this regard while servicing. 10:02:15 10:02:27

Q. When you say part of your job was maintenance and repair of the equipment, are you talking about the semiconductors that this company sold, or are you talking about the equipment used to manufacture those semiconductors? 10:02:28 10:02:30 10:02:34 10:02:38 10:02:40

A. The first part, that was the correct one. 10:03:12

Q. Okay. Did this company manufacture semiconductors? 10:03:13 10:03:15

A. It's an agent. 10:03:21

Q. And what does that mean, "it's an agent"? I'm 10:03:23
not sure I understand. 10:03:25

A. It's an agent for a particular equipment 10:03:36
manufacturer. It does not have a factory itself. 10:03:38

Q. Who was the equipment manufacturer for which 10:03:42
it was an agent? 10:03:43

A. I don't quite recall. There were quite a few. 10:03:57

Q. Was this a locally owned business in Taipei? 10:04:00

A. Yes. 10:04:02

Q. Okay. Other than what you've told us, did you 10:04:04
do anything differently for this company in those six 10:04:06
months? 10:04:10

A. No. 10:04:19

Q. And what was your next job after this one? 10:04:19

A. It was about maybe half a year or so later I 10:04:30
joined Panasonic. 10:04:36

Q. So sometime in 1992? 10:04:38

A. Yes. 10:04:43

Q. And we'll go through each one, but is it fair 10:04:45
to say that from 1992 through the present date you have 10:04:47
worked for -- continuously for some Panason- -- 10:04:49
Panasonic entity? 10:04:57

A. Same company, are you talking about the 10:05:17
Taiwanese one? 10:05:19

Q. I'm saying any company that's affiliated with Panasonic. I'm going to go back and break down exactly which ones, but I just want to know if there are any non-Panasonic companies from 1992 forward in your chronology? 10:05:19 10:05:23 10:05:27 10:05:28 10:05:32

A. No. 10:05:49

Q. Okay. What was the first company that you worked for in 1992, with Panasonic company? 10:05:49 10:05:57

A. In 1992 it was Panasonic. 10:06:12

Q. What was the -- if you know, what was the specific Panasonic entity that you worked for? 10:06:13 10:06:15

A. Panasonic Sales, Taiwan. 10:06:36

Q. All right. Was the name of that back in 1992 Matsushita Sales Taiwan? 10:06:38 10:06:45

A. In Chinese, that is correct; however, in English, it was called Panasonic Sales Taiwan. 10:06:57 10:06:58

Q. Okay. What was the position -- your first position there at Panasonic Sales Taiwan? 10:07:04 10:07:06

A. Sales engineer. 10:07:19

Q. And what were your duties as a sales engineer? 10:07:23

A. Quality, technology, specs, design-in, and also market information, and also push for payments. 10:07:40 10:07:49

Q. What products did you deal with initially? 10:08:08

A. The CRT. 10:08:13

Q. Any other products? 10:08:17

A. FBT. 10:08:19

Q. What is FBT? 10:08:21

A. It's a transformer inside of the CRT. 10:08:28

Q. Anything other than CRTs and FBTs? 10:08:32

THE INTERPRETER: Orange? 10:08:45

THE WITNESS: Orange color plasma display. 10:08:47

BY MR. ROSS: 10:08:51

Q. Anything else, sir? 10:08:57

A. No. 10:09:00

Q. The office was located in Taipei? 10:09:04

A. Yes. 10:09:06

Q. How long did you hold this title of sales engineer? 10:09:08 10:09:10

A. Two years. 10:09:17

Q. One of the things that you said you were responsible for was market information. What do you mean by that? 10:09:19 10:09:21 10:09:23

A. I also had to do sales work. 10:09:34

Q. By "market information" you mean sales work? 10:09:38

A. I also had to do the work of sales as well. 10:09:43

Q. All right. What -- what do you mean by the work of sales? 10:09:47 10:09:49

A. When it comes to the work of sales, because initially most of the work relate -- related to engineering. So therefore, we also had to do sales 10:10:12 10:10:15 10:10:19

work. 10:10:23

Q. And by "sales" do you mean that you went out 10:10:25

to customers and tried to sell them product? 10:10:27

A. Yes. 10:10:34

Q. So you did both engineering work and sales 10:10:36

work as a sales engineer between 1992 and 1994? 10:10:38

A. Correct, even all the way up until present. 10:11:00

Q. Right. I'm just trying to take it piece by 10:11:02

piece. And in this two-year period, did you also gather 10:11:04

market information about the market for CRTs? 10:11:10

A. Yes, I would obtain those information from the 10:11:25

customers. 10:11:28

Q. By "customers" you mean people who are buying 10:11:28

Panasonic Sales Taiwan's products? 10:11:32

A. They would make their purchases from MEC with 10:11:49

an LC. Those business were indirect business. 10:11:57

Q. I'm sorry, I'm not sure I understood the 10:12:02

question. Were these customers of yours, sir, or of a 10:12:04

different entity? 10:12:08

A. Our business was an indirect sales business. 10:12:23

MR. YOHAI: Excuse me, sorry. The 10:12:28

transcription said "NEC", I think he may have said 10:12:30

"MEC". 10:12:32

THE INTERPRETER: M. M-E-C. 10:12:36

MR. ROSS: MEC. Okay. That -- that makes 10:12:38

sense. NEC didn't, the spelling -- all right. 10:12:40

BY MR. ROSS: 10:12:43

Q. To be clear, your company, Panasonic Sales 10:12:43

Taiwan did not manufacture CRTs? 10:12:47

A. Correct, that's correct. 10:13:02

Q. You sold MEC CRTs? 10:13:04

A. Correct. 10:13:12

Q. And in this '92 to '94 time period, you were 10:13:13

selling to customers that been -- that had been 10:13:15

identified to you by MEC as potential purchasers of 10:13:19

their product? 10:13:23

A. There were designated accounts. There were 10:13:43

some fixed accounts. 10:13:45

Q. At this time, were all your accounts local 10:13:49

Taipei businesses? 10:13:57

A. Yes. 10:14:04

Q. You said that you held this position for a 10:14:06

couple of years. What was your next position at 10:14:08

Panasonic Sales Taiwan? 10:14:10

A. Seems like I was the vice director. We don't 10:14:23

call that director in English, we call it vice 10:14:32

coordinator. 10:14:36

Q. Vice coordinator for what? 10:14:38

A. Same thing. 10:14:43

Q. For quality, technology, specs, design-in, 10:14:45

market information, push for payments? 10:14:49

A. Yes. 10:15:02

Q. How long did you hold this position, sir? 10:15:04

A. I forget how long I worked in that job. 10:15:10

Q. Can you give me any estimate, are we talking a decade, a couple of years, can you give me some sense? 10:15:12 10:15:15

A. Seems like it was perhaps a year to a couple years or so. 10:15:21 10:15:38

Q. Did you still in this job obtain market information from customers? 10:15:42 10:15:43

A. Yes. 10:15:51

Q. Did you also start meeting with competitors of Panasonic to obtain market information from them? 10:15:57 10:16:00

A. Not at that time. 10:16:13

Q. Okay. Who did you report to while you were a vice coordinator for sales? 10:16:15 10:16:17

A. To the coordinator, or section manager. 10:16:32

Q. Do you recall who the section manager was at that time? 10:16:36 10:16:38

A. Michael Hsu. 10:16:43

Q. Is Michael Hsu also known as Chi-Yen Hsu? C-H-I dash Y-E-N in English. 10:16:51 10:16:58

A. Chi Hsu Yen. 10:17:06

Q. So is that a yes? 10:17:12

A. I'm not very familiar with the spelling of his 10:17:15

Chinese name. 10:17:17

Q. We'll look at some documents and we'll see. 10:17:21

And what -- and who did the sales director -- 10:17:23

I'm sorry. That wasn't what -- his name is. 10:17:27

Section director, was that his title? 10:17:30

MR. ROSS: Service manager. 10:17:36

THE WITNESS: Yes. 10:17:38

BY MR. ROSS: 10:17:38

Q. And who did the section manager report to back 10:17:40

at that time, what position? 10:17:42

A. The section manager would report to the 10:17:51

manager. At that time the manager's title is called a 10:17:57

GM. 10:18:06

Q. And who would the general manager report to? 10:18:15

A. Are you saying who the manager will be 10:18:25

reporting to? 10:18:28

Q. The position, not -- not necessarily the 10:18:30

individual. I'm trying to get a sense of the 10:18:32

organization. 10:18:34

A. The -- a general -- the manager will be 10:18:49

reporting to the head of the department. 10:18:51

Q. Head of the sales department? 10:18:58

A. Yes. 10:19:06

Q. And who did the head of the sales department 10:19:06

report to? 10:19:10

A. President. 10:19:23

Q. Now, in your role as vice coordinator, did you have any reporting duties to anyone at Panasonic back in Japan? 10:19:25 10:19:27 10:19:30

MR. YOHAI: Objection. Objection to the form of the question. Panasonic. 10:19:42 10:19:42

MR. ROSS: Words he used. 10:19:47

MR. YOHAI: Yeah, I know, all right. That's a lot -- a lot of names. 10:19:49 10:19:49

THE WITNESS: No, I didn't. The section manager would report to MEC directly. 10:20:04 10:20:04

BY MR. ROSS: 10:20:13

Q. Got it. Okay. So that gets us through maybe '95-'96, this one to two years as a vice coordinator. 10:20:13 10:20:15

What was your next position, sir? 10:20:21

A. Coordinator. 10:20:32

Q. The next position was coord- -- coordinator. Is that the same as section manager? 10:20:36 10:20:38

A. No. A coordinator is a coordinator. A section manager is a manager. 10:20:45 10:20:57

Q. Does the coordinator report to the section manager? 10:21:00 10:21:02

A. Yes. 10:21:08

Q. So when you were a coordinator, you reported to the section manager? 10:21:08 10:21:12

A. Yes. 10:21:17

Q. And how long were you a coordinator? 10:21:17

A. Seems like it's close to three years. I would say three years. 10:21:28 10:21:30

Q. So if my chronology is right, roughly 1996 through 1998? 10:21:32 10:21:38

A. More or less. 10:21:47

Q. Okay. As a coordinator, did you still have responsibility for the same things that you did as a vice coordinator? 10:21:47 10:21:57 10:22:00

A. Pretty much. 10:22:08

Q. Did you still -- in that three-year period, who was the section manager that you reported to, and if it was more than one, please tell me. 10:22:08 10:22:13 10:22:17

A. The same one. 10:22:30

Q. And who was that person? 10:22:32

A. Michael Hsu. 10:22:36

Q. Michael Hsu. And -- okay. 10:22:38

Did you still have, as coordinator, the responsibility of obtaining market information from customers? 10:22:42 10:22:51 10:22:57

A. The same thing. 10:23:06

Q. Okay. And at this point, as a coordinator, did you start attending meetings with competitors? 10:23:06 10:23:08

A. Yes. 10:23:17

Q. Okay. What was your next position at the company? 10:23:19 10:23:32

A. Vice section manager. 10:23:38

Q. And as vice section manager, did you still report to the section manager? 10:23:45 10:23:47

A. Correct. 10:23:58

Q. And about how long were you vice section manager? 10:23:58 10:24:02

A. A little over three years. 10:24:08

Q. So roughly 1999 through 2001? 10:24:10

A. Yes, more or less. 10:24:19

Q. And during those three years, was Mr. Michael Hsu still the section manager that you reported to? 10:24:23 10:24:27

A. Yes. 10:24:34

Q. At this point, do you know who the general manager was that Mr. Hsu reported to? 10:24:47 10:24:49

A. I think Mr. Hsu was promoted to become the general manager at that time. 10:25:02 10:25:08

Q. And when he was promoted, who did he succeed, who was general manager before him? 10:25:10 10:25:13

A. I believe the last name was Ho. 10:25:27

MR. ROSS: Madam Translator, how are you spelling that? 10:25:32 10:25:34

THE INTERPRETER: Interpreter spelling H-O. 10:25:36

MR. ROSS: Thank you, should have guessed 10:25:38

that. 10:25:40

BY MR. ROSS: 10:25:42

Q. When you were -- when Mr. Hsu was promoted to general manager, did you as a vice section manager report directly to him, or was there a new section manager that you reported to? 10:25:42 10:25:47 10:25:51 10:25:58

A. Mr. Hsu also held a job as a section manager. 10:26:13

Q. So he was both section manager and general manager? 10:26:17 10:26:19

A. Yes. He worked both positions. 10:26:25

Q. Okay. And in your role as vice section manager, did you have the responsibility for obtaining market information? 10:26:27 10:26:32 10:26:34

A. Same thing. 10:26:43

Q. Okay. 10:26:45

A. As when I was a coordinator. 10:26:45

Q. And so you continued to meet with competitors while you were the vice section manager? 10:26:47 10:26:49

A. Yes. 10:26:51

Q. Okay. Your next position, sir, after vice section manager? 10:27:00 10:27:06

A. Section manager. 10:27:08

Q. And about how long did you hold the position of section manager? 10:27:13 10:27:15

A. I worked in that position for approximately 10:27:25

seven to eight years, I would say seven years. 10:27:28

Q. So roughly 2002 through 2009? 10:27:32

A. From 2001 to 2007 or 2006. 10:27:45

Q. Okay. 10:27:51

A. I think it was 2007. 10:27:57

Q. Thank you, sir. 10:27:58

During this time did you continue to report to 10:28:00

the general manager? 10:28:04

A. Yes. 10:28:10

Q. And during that time was that always Mr. Hsu, 10:28:10

or did that change at some point? 10:28:13

A. I reported to Mr. Hsu. 10:28:21

Q. Okay. And did your responsibilities continue 10:28:23

to include obtaining market information? 10:28:28

A. Yes. 10:28:36

Q. And did you continue to meet with competitors 10:28:36

during this time? 10:28:38

MR. YOHAI: Objection to the form of the 10:28:40

question. 10:28:40

THE WITNESS: At that time there were no more 10:28:47

CRT business. 10:28:57

BY MR. ROSS: 10:28:58

Q. When did the CRT business stop for you, 10:28:58

your -- 10:29:02

A. At the end of 2000, MEC announced that they 10:29:25

were not going to do it anymore. By 2001, after the inventories were sold, the business were no longer there. 10:29:28 10:29:32 10:29:36

Q. When you say MEC announced that it was no longer going to do it anymore, can you be more specific? Were they not going to sell in Taiwan, were they not going to manufacture CRTs at all worldwide, can you -- can you tell us exactly what you mean by that? 10:29:45 10:29:47 10:29:57 10:29:58 10:30:02

A. Do you want to be -- do you want me to be very detailed? 10:30:27 10:30:30

Q. Please. 10:30:30

A. By the end of 2000, MEC said that they were going to give up on the CRT business. In 2001 they sold all the inventories on hand. All the inventories were CDT inventories. 10:30:42 10:30:45 10:31:02 10:31:12

Q. PD. 10:31:23

A. Then they joined with Toshiba and formed NTPD. 10:31:27

THE INTERPRETER: Interpreter would like to verify the acronyms. 10:31:40 10:31:42

Interpreter would like to correct the previous spelling. It should be "MTPD". 10:31:57 10:31:58

THE WITNESS: The sales right in Taiwan belonged to Sumitomo Taiwan. 10:32:13 10:32:19

BY MR. ROSS: 10:32:23

Q. Okay. Let me ask a couple questions about 10:32:23

that. My -- is it your understanding that Matsushita continued to manufacture CRTs up until the point when MTPD was formed? 10:32:25 10:32:34 10:32:38

MR. YOHAI: Objection in the form of the question. 10:32:58 10:33:00

THE WITNESS: They no longer manufactured CDTs. To my understanding the CRT for TV portion for a CPT, they joined together with MTPD. 10:33:06 10:33:10 10:33:27

BY MR. ROSS: 10:33:32

Q. But what I'm getting at is was there a time at which they stopped manufacturing -- well, strike all that. 10:33:32 10:33:38 10:33:43

When you were selling CRTs, was it both CDTs and CPTs up until the time you stopped? 10:33:43 10:33:47

A. Primarily CDTs, although we did try to promote CPTs; however, it was not successful. We did not sell it at all. 10:34:08 10:34:13 10:34:17

Q. In Taiwan? 10:34:19

A. Correct, in Taiwan. 10:34:23

Q. And once MTPD was formed there was a different sales agent for that company in Taiwan? 10:34:25 10:34:30

A. That's correct. That would be Sumitomo. 10:34:47

Q. Okay. I'm going to take our first break relatively soon, but just a couple more questions if you're okay to go forward. 10:34:57 10:35:00 10:35:02

A. Yes. 10:35:04

Q. And I just want to finish the chronology. 10:35:04

It's not all that important, but after 2007, you said 10:35:08

that's about the end of when you were section manager. 10:35:12

What was your next position? 10:35:15

A. I worked as a project GM for about half a 10:35:42

year. 10:35:43

Q. And then after that? 10:35:45

A. GM. 10:35:45

Q. GM of Panasonic Sales Taiwan? 10:35:47

A. Yes. At that time the name was changed to 10:36:00

Panasonic Industry Sales Taiwan. 10:36:12

Q. And how long did you hold that position? 10:36:13

A. Until this year. 10:36:23

Q. Do you mean to the present, or has it changed? 10:36:25

A. It was changed recently. 10:36:30

Q. And what is your new position at the company? 10:36:32

A. I became the project GM. 10:36:40

Q. What is a project GM, just generally? 10:36:43

A. I don't have a team. It's just a single 10:36:58

person. 10:37:00

Q. Consulting in the company? 10:37:02

MR. YOHAI: Objection to the form of the 10:37:04

question. 10:37:04

THE WITNESS: Same thing, I'm doing sales and 10:37:12

engineering. 10:37:13

BY MR. ROSS: 10:37:15

Q. And then real quick, when you were vice 10:37:15

section manager, from 1999 to 2001, before you became 10:37:19

section manager, did you have a -- any reporting 10:37:23

requirements to headquarters in Japan? 10:37:27

A. That would depend on the request from the GM, 10:37:43

or the section manager. 10:37:49

Q. So depending on what your boss, Mr. Hsu, would 10:37:57

ask you -- ask of you, you might have certain reporting 10:38:02

requirements to MEC in Japan? 10:38:04

A. Yes. 10:38:08

MR. ROSS: Why don't we take that first break. 10:38:19

MR. YOHAI: Okay. 10:38:21

THE VIDEOGRAPHER: Going off the record. The 10:38:21

time is 10:38. 10:38:22

(Recess taken.) 10:50:00

THE VIDEOGRAPHER: Back on the record. The 10:50:02

time is 10:50, please continue. 10:50:02

MR. ROSS: We're going to -- 10:50:08

THE COURT REPORTER: Would counsel on the 10:50:13

phone please state their appearance for the record. 10:50:13

MR. FRUTIG: This is Matt Frutig, from White & 10:50:17

Case, representing the Toshiba defendants. 10:50:19

THE COURT REPORTER: Anyone else? 10:50:25

MR. ROSS: I heard a lot of pings. 10:50:25

MR. YOHAI: Yeah. Okay. 10:50:27

MR. ROSS: We'll continue. 10:50:30

BY MR. ROSS: 10:50:30

Q. Mr. Chang, we're back from a break. Are you 10:50:30

ready to continue? 10:50:34

A. All right. 10:50:43

Q. In our previous session, you had talked about 10:50:43

the section manager position. Do you recall that? 10:50:45

A. The -- a position of section manager. 10:50:58

Q. How many sections were there at Panasonic 10:51:02

Sales Taiwan? 10:51:02

A. What time period? 10:51:12

Q. Let's do the time period from 1992 through 10:51:13

2001. Now, if that changed, let me know and I'll make 10:51:17

it a smaller time period. 10:51:21

A. It had a lot of changes. 10:51:32

Q. Okay. What was the section called that you 10:51:34

were in in those years? 10:51:36

A. When I was a section manager? 10:51:45

Q. Maybe you can't answer this because it 10:51:47

changed, but in the time that you joined Panasonic Sales 10:51:49

Taiwan as a sales engineer up until before you were a 10:51:51

section manager, what section were -- were you in, in 10:52:00

all those positions? 10:52:04

A. Display section. 10:52:28

Q. Display. So were the sections divided by 10:52:32

product? 10:52:36

A. Correct. 10:52:43

Q. Okay. And within that section, was there a -- 10:52:43

were sales and marketing split up into two different 10:52:51

subsections, or how was that handled? 10:53:00

A. You mean within the section? 10:53:19

Q. Correct. 10:53:21

A. Within the section it's by customer. 10:53:27

Q. So sales and marketing would be handled by the 10:53:32

same people? 10:53:36

A. Sales and marketing, yes. 10:53:49

Q. Okay. And from the time -- you had four 10:53:51

positions up until you became section manager: Sales 10:53:57

engineer, vice coordinator, vice -- sorry, coordinator, 10:53:58

and then vice section manager. 10:54:02

During those four positions did the products 10:54:04

in your section change at all, or was it always CRTs, 10:54:10

FBTs, orange and plasma display, orange-colored plasma 10:54:15

display, sorry? 10:54:23

A. Basically, I didn't have much changes. 10:55:10

Q. Were LCDs ever a part of your section? 10:55:13

A. Since either 1999 or from the end of 1980 -- 10:55:28

1998, I forget. 10:55:32

Q. Okay. As part of your market information gathering duties, did you ever meet with competitors in the LCD business? 10:55:34 10:55:38 10:55:43

MR. YOHAI: Objection to the form of the question. 10:56:02 10:56:02

THE WITNESS: No. 10:56:04

BY MR. ROSS: 10:56:04

Q. Okay. I want to focus now for the next series of questions on the time period 1996 through 2006. Do you have that in your head? 10:56:04 10:56:12 10:56:19

A. What do you mean by "in my head? 10:56:32

Q. My questions are going to be about that time period. I just want to make sure you're -- 10:56:36 10:56:38

A. All right. 10:56:42

MR. YOHAI: I'm just going to object. He said that's a very long time frame. If it becomes necessary to break that down, I would appreciate if the questioner will give him some guidance on which time period within that time period he's asking about. 10:56:43 10:56:45 10:56:47 10:56:51 10:56:58

MR. ROSS: Absolutely. And it may be that the witness is going to have to guide me on that. 10:57:00 10:57:02

MR. YOHAI: Yes. 10:57:03

MR. ROSS: But -- 10:57:04

BY MR. ROSS: 10:57:06

Q. I first want to talk about your customers for 10:57:06

CRTs. Okay. Who were in this time period your -- by "your" I mean your company's customers for CRTs. 10:57:10 10:57:13

MR. YOHAI: Objection, again, same objection in time. 10:57:30 10:57:36

THE WITNESS: From 1996 through 1999 it changed as far as my part is concerned. 10:57:57 10:57:58

BY MR. ROSS: 10:58:04

Q. To your knowledge, let's start with the period you just talked about, 1996 to 1999, who were the customers of Panasonic Sales Taiwan for CRTs? 10:58:04 10:58:06 10:58:10

A. API, Royal, Bridge -- you're referring to companies? 10:58:32 10:58:45

Q. I'm referring to companies who are buying your products, CRT prod- -- 10:58:47 10:58:49

A. CTS. C-A-P-E, Cape, and ADI. Those are the main ones. I don't quite recall about the rest. 10:58:58 10:59:17

Q. Okay. Now, these that you can remember for this time period, what -- what type of finished products were they using the CRTs in? 10:59:23 10:59:25 10:59:28

A. Monitors. Computer monitors. 10:59:45

Q. And do you know where they sold their computer monitors? 10:59:57 11:00:00

A. All sorts of possibilities, I'm not too sure. 11:00:12

Q. Okay. That's 1996 through 1999. What about 2000 through 2006, did the customer lineup change? 11:00:13 11:00:21

A. Seems like in 2000 we had an additional customer, TPV. And also Sampo. We didn't have any more customers after 2011. 11:00:45 11:00:47 11:01:08

CHECK INTERPRETER: The check interpreter's correction: We didn't have any customers after 2000 -- 11:01:12 11:01:12

MR. ROSS: One. 11:01:17

CHECK INTERPRETER: -- and one. 11:01:17

THE INTERPRETER: Thank you. 11:01:19

BY MR. ROSS: 11:01:21

Q. So the only two additional customers you had in 2000, 2001, were TPV and Sampo? 11:01:21 11:01:25

A. There's another one. It was a small one. I don't remember the name. 11:01:40 11:01:43

I remember the Chinese name, which is Yichun. I do not remember their English name. 11:01:57 11:02:02

Q. That's fine. And were these also CRTs that were used in computer monitors? 11:02:04 11:02:08

A. Yes. 11:02:15

Q. You said earlier that you tried to sell CPTs that were used in televisions but had been generally unsuccessful. Did you have any success in selling CPTs? 11:02:17 11:02:21 11:02:23

A. Success, I don't think so. I don't have much recollection about that. 11:02:49 11:02:57

Q. Do you -- do you recall why you found it difficult to sell CPTs? 11:02:58 11:03:00

MR. YOHAI: Objection to the form of the question. 11:03:08

THE WITNESS: Because there is Panasonic brand name in Taiwan. And the market share is quite significant. The customers thought that we were in competition with them. 11:03:23 11:03:25 11:03:30 11:03:34

BY MR. ROSS: 11:03:38

Q. In competition with? 11:03:38

A. To compete with the Taiwanese local brands. 11:03:45

Q. Okay. Now, I gather that from -- in 2000 and 2001 you continue -- continued selling to API, Royal, Bridge, CTS, Cape and ADI and just added TPD and Sampo. Do I have that right? 11:03:51 11:04:00 11:04:04 11:04:10

A. Incorrect. 11:04:27

Q. Okay. 11:04:27

A. Some of the customers no longer purchased from us. 11:04:32 11:04:34

Q. Which ones? 11:04:34

A. API, Royal, ADI and Cape. Some of them just disappeared. Some of them went bankrupt. 11:04:43 11:05:00

Q. And as you testified with regard to 1996 to 1999, am I correct that you don't know where the customers you were selling to in 2000, 2001, sold their CRT finished products, the monitors? 11:05:08 11:05:12 11:05:15 11:05:21

A. Correct, because they were all over the world. 11:05:51

Q. Okay. Thank you, sir. 11:05:57

Sir, now I want to ask you about your 11:06:08

competitors. Again, and you can break it down time wise 11:06:10

if you need to just like you did with regard to 11:06:15

customers, but in this 1996 to 2006 time period, who did 11:06:19

Panasonic Sales Taiwan consider its competitors, 11:06:27

competitor companies, that were making and selling CRTs? 11:06:30

MR. YOHAI: Objection to the time frame. 11:07:13

THE WITNESS: My knowledge is only limited to 11:07:25

1996 through 2001 because I was not involved after 2001. 11:07:27

BY MR. ROSS: 11:07:34

Q. That's fine. And I should have said 2001, I 11:07:36

apologize. In that time period, who did -- did your 11:07:38

company consider its competitors in CRTs? 11:07:42

A. Hitachi, CPT. 11:08:02

Q. Can I stop you there, is -- by CPT, do you 11:08:06

mean Chunghwa? 11:08:10

A. Yes. 11:08:12

Q. Sorry, go ahead, sir. 11:08:12

A. Samsung, LG, and also Dai Yi, Orion. 11:08:17

Q. All right. Anybody else, sir? 11:08:36

A. Those are the more frequent encountered 11:08:49

customers. 11:08:58

Q. Customers or competitors? 11:08:58

A. Those are the competitors whom I heard from 11:09:08

the customers. 11:09:10

Q. Okay. 11:09:12

A. These are the more frequent mentioned names. 11:09:12

Q. Thank you, sir. Let me just throw out a 11:09:15

couple other names and see if you considered them 11:09:17

competitors. What about Philips? 11:09:19

MR. MALAISE: Objection, vague as to Philips. 11:09:28

THE WITNESS: I rarely hear the name of 11:09:38

Philips from the customers. I myself have not heard of 11:09:42

this name from the customers personally. 11:09:43

BY MR. ROSS: 11:09:47

Q. So when you say you rarely heard it, others in 11:09:47

your company heard of Philips as a competitor? 11:09:51

MR. YOHAI: Objection. 11:09:58

Objection to the form. 11:10:06

THE WITNESS: I don't quite understand. 11:10:10

BY MR. ROSS: 11:10:13

Q. You said you yourself had not heard the name 11:10:13

Philips from customers, but you said that customers 11:10:15

rarely said it. That in my mind meant that you might 11:10:19

have heard it from colleagues of yours at your company 11:10:21

that Philips was one of your competitors. That's all 11:10:25

I'm asking. 11:10:28

MR. YOHAI: Objection to the form, no 11:10:58

foundation. 11:11:00

THE WITNESS: How should I respond to that? I rarely hear that name from my colleagues. 11:11:06 11:11:15

BY MR. ROSS: 11:11:17

Q. It's the word "rarely" that's causing me a problem. Does that mean you occasionally heard the name, just not that often, or are you using that word in a different way? 11:11:19 11:11:23 11:11:25 11:11:28

MR. YOHAI: Objection to the form. Asked and answered. 11:11:38 11:11:40

THE WITNESS: What I meant was that the customers would compare us with other competitors. Those were the names in which I mentioned earlier. I rarely hear the name of Philips. I do know that Philips does CRTs, but I rarely hear its name. 11:12:06 11:12:08 11:12:12 11:12:19 11:12:23

BY MR. ROSS: 11:12:30

Q. What about Toshiba? 11:12:32

MR. FRUTIG: Objection, this is Matt Frutig, vague as to Toshiba. 11:12:36 11:12:40

THE WITNESS: I rarely hear about Toshiba as well. 11:12:42 11:12:43

BY MR. ROSS: 11:12:43

Q. Okay. Let's turn to some questions about pricing. Who was it in your group, in your section who was responsible for determining the prices at which you would sell CRTs? 11:13:00 11:13:02 11:13:06 11:13:08

MR. YOHAI: Objection, no foundation. 11:13:25

THE WITNESS: Our branch office in Taiwan does not have the authority to make decision on pricing. 11:13:34

BY MR. ROSS: 11:13:40

Q. Who had the authority? 11:13:40

A. The MEC in Japan. 11:13:47

Q. So if you would, sir, tell us a little bit about how that worked when you were negotiating with a customer over how much it would cost them to buy your CRTs, how -- how would you do that if you did not have pricing authority? How did you take your instructions from Japan? If you could walk us through that process, it would be helpful. 11:13:49 11:13:57 11:13:58 11:14:02 11:14:08 11:14:10 11:14:15

A. All right. First of all, we will collect customers' demands and also market information. And also the potential volume and -- that the customers were promised. Specifications, whether or not the product has already come to the testing phase to insure that they -- whether or not they have already brought in, inputted our model numbers. 11:14:42 11:14:51 11:15:04 11:15:13 11:15:23 11:15:32 11:15:38

After we integrate all the information, we would submit it to Japan. Based on the overall situation people would come personally from Japan to Taiwan to visit the customer. They may visit them once, twice, or multiple times to insure that our information 11:15:45 11:15:47 11:16:00 11:16:08 11:16:17

collected and all the things that we were supposed to do have been done. And they will determine directly face to face with the customers what the price would be and what the quantities would be. 11:16:28 11:16:32 11:16:43 11:16:47

PST's concern is more the better. 11:17:04

Q. I'm -- PST would be Panasonic Sales Taiwan? 11:17:08

A. That's correct. 11:17:13

Q. Thank you, sir. The market information that you would collect as part of this package that got sent back to Japan, that would include market information that you obtained from the customer, correct, sir? 11:17:19 11:17:23 11:17:27 11:17:30

A. Yes, primarily the market information from the customers. 11:17:49 11:17:57

Q. It would also include market information that you obtained from your competitors in the meetings you had with your competitors, right, sir? 11:17:58 11:18:00 11:18:04

MR. YOHAI: Objection to the form of the question. 11:18:13 11:18:13

THE WITNESS: No. 11:18:15

BY MR. ROSS: 11:18:15

Q. How would you communicate the information you received from competitors back to Japan for pricing determination? 11:18:15 11:18:17 11:18:21

MR. YOHAI: Objection, no foundation. 11:18:32

THE WITNESS: Those are two different things. 11:18:36

BY MR. ROSS: 11:18:38

Q. How are they different things? 11:18:38

A. First of all, one part is from the customers. 11:18:47

They will tell us about the competitor -- competitor's 11:18:51

information. 11:19:00

CHECK INTERPRETER: Check interpreter's 11:19:02

clarification. One part -- first of all, one part is 11:19:02

from the customers. They will tell us about their 11:19:06

demands as well as the competitors' information. 11:19:10

THE INTERPRETER: Okay. Thank you. 11:19:13

BY MR. ROSS: 11:19:13

Q. And the other part, sir, is from your meetings 11:19:15

with competitors, right, sir? 11:19:17

MR. YOHAI: Objection, no foundation. 11:19:23

THE WITNESS: When we talk about pricing with 11:19:34

the customers, we would not mix it up with the 11:19:36

competitors' information. 11:19:38

BY MR. ROSS: 11:19:42

Q. Would you send information that you obtained 11:19:42

from competitors to Japan? 11:19:43

A. Are you talking about how to set pricing with 11:20:10

the customer? 11:20:12

Q. My question is not what it may or may not have 11:20:13

been used for. My question is any information that you 11:20:15

obtained from competitors, from meetings that you said 11:20:17

you had with competitors, did you send that information to Japan? 11:20:21 11:20:23

A. Yes. It was sent to Japan. Primarily the product production information and also shipment information. 11:20:43 11:20:58 11:21:02

CHECK INTERPRETER: Check interpreter's clarification. Yes, it was sent to Japan. Primarily the product -- the final -- or the finished product production and shipping information. The finished product information. 11:21:04 11:21:04 11:21:08 11:21:13 11:21:17

MR. ROSS: Are you accepting his change or not? 11:21:19 11:21:23

THE INTERPRETER: The interpreter sees not a significant distinction, but that's fine. 11:21:23 11:21:25

MR. YOHAI: It could be significant, so... 11:21:28

MR. ROSS: But it's -- whether it's significant or not. 11:21:30 11:21:30

MR. YOHAI: Right. Do you agree? 11:21:32

MR. ROSS: Do you as the interpreter agree with what the check interpreter is saying or not? 11:21:34 11:21:36

THE INTERPRETER: May the interpreter clarify that with the witness? 11:21:38 11:21:40

MR. ROSS: Sure, go ahead. 11:21:42

THE WITNESS: Yes. Yes, interpreter accepts the check interpreter's clarification. 11:21:45 11:21:47

BY MR. ROSS: 11:21:51

Q. Okay. Let's see, who did you communicate with 11:21:51
internally at MEC Japan regarding the information that 11:22:04
was sent to them either from the customers or from the 11:22:10
competitors? 11:22:17

A. If you're talking about the customers' demand 11:22:47
and pricing information, and that would be the MECs 11:22:49
account sales. If you're talking about the overall 11:22:58
information including the competitors' information, that 11:23:13
would be the section manager of MEC. 11:23:17

Q. Which section? 11:23:21

A. The one which is responsible for Taiwan. 11:23:28

Q. Do you recall in the time period 1996 through 11:23:32
2001 which particular individuals held that position, 11:23:34
the section manager at MEC responsible for Taiwan? 11:23:40

A. The person I can remember more clearly would 11:24:08
be Mr. Miamoto and there was another person named Sanco 11:24:10
Yamaguchi. 11:24:17

Q. Okay. With regard to the customer information 11:24:28
that was sent to the MEC accounts sales, how did that 11:24:30
information get communicated? Was it in written form, 11:24:34
verbally, how did that information get from your offices 11:24:36
and not Taipei to MEC account sales? 11:24:40

A. Primarily via oral communication and faxes. 11:25:21

Q. So both oral and written? 11:25:27

A. Yes. 11:25:30

Q. And what about the competitor and other information that you sent to the section manager of MEC responsible for Taiwan, how is that information communicated? 11:25:32 11:25:36 11:25:40 11:25:42

A. There would be communicated via faxes or when they come and visit us, or when we go and visit MEC, we would provide the information to them. 11:26:17 11:26:21 11:26:27

Q. When it was face to face, whether they were with you in Taipei or you were in with them in Japan, did you prepare written reports, or just give them the information orally? 11:26:30 11:26:32 11:26:40 11:26:43

A. Some written reports would be prepared. 11:27:06

Q. In this 1996 through 2001 time period, did you yourself personally ever prepare information in a written report that was either faxed or given by hand to MEC officials? 11:27:15 11:27:19 11:27:23 11:27:28

A. Yes. 11:27:49

Q. Who else worked with you, either for you or above you at Panasonic Sales Taiwan in this time period, 1996 to 2001, would also prepare these reports? 11:27:51 11:27:58 11:28:06

A. All of them. 11:28:30

Q. "All of them" meaning you did all of them, or everybody who you worked with did these reports? I don't understand. 11:28:32 11:28:36 11:28:38

MR. YOHAI: Objection to the form. You can answer. 11:28:45 11:28:47

THE WITNESS: If you're talking about information from the customers, everyone would go and collect them. And after the information have been collected, we will integrate the information, but usually either I will compile the information, or my boss, and we would all be involved. 11:29:13 11:29:13 11:29:17 11:29:21 11:29:25 11:29:28

BY MR. ROSS: 11:29:34

Q. The last couple of questions we've been talking about the competitor information that went to the section manager responsible for Taiwan at MEC. So that's what my questions are focused on. 11:29:34 11:29:36 11:29:40 11:29:43

MR. YOHAI: Objection to the form. The record speaks for itself as to what the questions were. 11:30:08 11:30:10

BY MR. ROSS: 11:30:12

Q. My question is, other than yourself, did anybody else who you worked with in Taipei create such reports? 11:30:13 11:30:15 11:30:17

MR. YOHAI: Objection. 11:30:28

Objection. Vague. 11:30:28

THE WITNESS: All of the sales have done that including my boss. 11:30:36 11:30:38

BY MR. ROSS: 11:30:40

Q. Mr. Hsu? 11:30:40

A. Yes. 11:30:42

Q. Yeah. 11:30:43

A. All of us. 11:30:43

Q. Did these reports have a title, a specific title? 11:30:45

A. No, it's different every time. 11:30:47

Q. Was there a standard format used for these reports? 11:31:00

A. Sometimes yes, sometimes not. It depends on the time period. It would change from time to time. 11:31:02

Q. Can -- can you describe for us when a standard format was used, what it looked like? 11:31:19

A. Standard formats, there were a lot of them, the Taiwanese customer's name shipment volume by quarter, the projected quantity as well as the actual quantity. 11:31:25

MR. ROSS: You used "customer" in your translation. Did -- did the witness say "customer", because the question was about competitor information. 11:31:28

MR. YOHAI: Counsel, I think the witness is confused. 11:32:23

MR. ROSS: It may be, that's why I'm asking the question. 11:32:32

MR. YOHAI: I understand. 11:32:34

MR. ROSS: I'm trying to focus on his -- the 11:32:36

information collected from competitors. 11:32:38

Does the witness understand that that's what 11:32:40

I'm asking about with regard to these questions? 11:32:43

THE INTERPRETER: Is the question addressed to 11:32:45

the interpreter? 11:32:47

MR. ROSS: Yes. No, I'm now -- okay. Let me 11:32:47

rephrase it differently. 11:32:49

BY MR. ROSS: 11:32:51

Q. Sir, Mr. Chang, do you understand that I'm 11:32:51

asking you questions about your information that you 11:32:57

obtained from competitors, not customers at this point, 11:33:00

but competitors? 11:33:04

A. Primarily what we send to them are those 11:33:27

information we collected regarding customers' shipment 11:33:30

information. 11:33:34

Q. I'm not sure we're on the same page. 11:33:38

MR. YOHAI: I agree. 11:33:42

BY MR. ROSS: 11:33:42

Q. You testified that the customer information 11:33:42

that was collected, what they asked for, the market 11:33:43

information they may give, all this stuff, was sent to 11:33:49

the MEC accounts for sales division. Do you recall 11:33:51

that? 11:34:00

A. Yes. 11:34:27

Q. Okay. You also testified that when it -- with 11:34:28

regard to competitor information and other market information, that you would inform the section manager for Taiwan at MEC about that information. Do you recall that, sir? 11:34:30 11:34:32 11:34:36 11:34:42

A. As far as the competitors' information, what I collect are primarily the shipment information from Taiwan. As far as the total status of the competitors, I don't have an overall picture. 11:35:23 11:35:27 11:35:32 11:35:38

MR. ROSS: Objection. Nonresponsive. 11:35:42

BY MR. ROSS: 11:35:43

Q. My question, sir, is: Regardless of what you collected -- we're going to talk about that -- but right now I just want to find out where the information went. 11:35:43 11:35:47 11:35:51

Is it true that you sent the competitor information that you collected, whatever it was, to the section manager for Taiwan at MEC in Japan? 11:35:57 11:36:00 11:36:02

A. Yes. 11:36:43

Q. Okay. And is it true that sometimes that information was passed along orally, and sometimes it was passed along in written reports that either were faxed or handed in a face-to-face meeting to the section manager for Taiwan at MEC? 11:36:45 11:36:47 11:36:51 11:36:57 11:37:02

A. Yes. 11:37:23

Q. And what I was trying to get at was a description of what these reports might look at. Let me 11:37:27 11:37:30

make a suggestion and you can tell me if I'm wrong. 11:37:32

Were these -- every time you met with a 11:37:34

competitor, would you write up a meeting report and that 11:37:36

report, whatever you put into it, would be the type of 11:37:40

report that you would send to the section manager for 11:37:42

Taiwan at MEC? 11:37:47

MR. YOHAI: Objection to the form. 11:38:30

THE WITNESS: I believe I would usually 11:38:49

communicate that orally, or by fax. I may not 11:38:51

necessarily have a regular format. 11:39:06

BY MR. ROSS: 11:39:10

Q. Let me ask you this, sir, would you 11:39:10

maintain -- if you did it as a report, a written report, 11:39:10

would you maintain that report in your offices? 11:39:15

A. Maintain in my office, you mean right now? 11:39:32

Q. Would you keep a copy? 11:39:35

A. Yes, I would. At that time. 11:39:40

Q. Sure. Was -- were the reports generally 11:39:43

written in English, Chinese, or Japanese? 11:39:45

A. Majority of the data were numbers. And the 11:40:02

title would be English. 11:40:04

Q. To the extent that there was any descriptive 11:40:06

text along with the data that you would supply to MEC in 11:40:08

Japan, would that text be written in English? 11:40:15

A. Yes, seldom. 11:40:40

Q. As you sit here today, do you know if in your offices in Taipei those reports still exist, copies of those reports? 11:40:47 11:40:49 11:40:58

A. No, they would not have it. 11:41:10

Q. Do you know when those reports were discarded? 11:41:12

A. We would deliver those to the warehouse annually. Since the warehouse space of the company is limited, we would have a fixed schedule to discard them every few years. 11:41:25 11:41:27 11:41:43 11:41:47

Q. Can you give us the -- and then we need to change the tape, because we're almost at the end of it. 11:41:49 11:41:57

Do you know specifically, when you say "every few years", was it every three years, every four years, do you know what the schedule was for destruction of documents? 11:41:58 11:42:00 11:42:04 11:42:06

A. I don't recall exactly how many years they would discard them; however, the policy was set up prior to my joining the company. 11:42:28 11:42:30 11:42:34

MR. ROSS: Okay. We need to change the tape. 11:42:38

THE VIDEOGRAPHER: This marks the end of Volume I, media one, of the deposition of Yu-Hao Zhang, a/k/a Allen Chang. The time is 11:43. We are off the record. 11:42:40 11:42:42 11:42:45 11:42:49

(Recess taken.) 11:51:32

THE VIDEOGRAPHER: We are back on the record 11:51:34

at 11:51 a.m. This marks the beginning of Volume I, media number two, in the deposition of Yu-Hao Zhang, a/k/a Allen Chang. Please continue. 11:51:34 11:51:38 11:51:40

BY MR. ROSS: 11:51:43

Q. Sir, are you ready to go? 11:51:43

A. Yes. 11:51:45

Q. Sir, now I want to talk to you a bit about your meetings with competitors. Okay, sir? 11:51:45 11:51:49

A. All right. 11:51:58

Q. Okay. In this period from 1996 through 2001, about how many times did you meet with your company's competitors? 11:51:58 11:52:04 11:52:10

MR. YOHAI: Objection, vague. 11:52:15

THE WITNESS: I don't recall. 11:52:19

BY MR. ROSS: 11:52:19

Q. Can you give us any sense of scale, less than five, more than 50, or any -- any reasonable estimation? 11:52:19 11:52:23

MR. YOHAI: Objection. Vague. 11:52:40

THE WITNESS: I don't recall. 11:52:42

BY MR. ROSS: 11:52:42

Q. Okay. Do you recall that at least once you met with a large group of competitors, about five of your competitors, do you recall that, sir, at one meeting? 11:52:42 11:52:43 11:52:47 11:52:51

A. Yes, I do recall that. That was quite unique. 11:53:13

Q. Yes, in fact, after attending that -- what we call group or glass meeting, isn't it the case that you never attended another one of those group meetings again? 11:53:17 11:53:21 11:53:23 11:53:27

MR. YOHAI: Objection to the phrase "glass meeting". 11:53:47 11:53:47

THE WITNESS: That's correct. 11:53:57

BY MR. ROSS: 11:53:57

Q. Thank you. 11:53:57

A. I've not heard about glass meeting at that time. 11:54:00 11:54:02

Q. I think actually in that question you said group meeting. 11:54:04 11:54:06

MR. YOHAI: You said "group or glass", that's why I objected. 11:54:08 11:54:10

BY MR. ROSS: 11:54:10

Q. I think we're on the same page. 11:54:10

MR. YOHAI: Yes. 11:54:12

BY MR. ROSS: 11:54:12

Q. Do you understand you never attended a competitor meeting with more than one or two other competitors after that one meeting that you do recall, is that correct? 11:54:13 11:54:13 11:54:17 11:54:19

A. Yes. 11:54:36

Q. Can I ask you, sir, why not? 11:54:36

A. No one notified me, I don't know. 11:54:45

Q. Did you make a specific decision to not attend further group meetings and rather just meet one on one with your various competitors? 11:54:47 11:54:51 11:54:58

MR. YOHAI: Objection to the form. 11:55:15

THE WITNESS: How should I respond to that question? 11:55:21 11:55:21

BY MR. ROSS: 11:55:23

Q. I can't tell how you to. Do you not understand the question? 11:55:23 11:55:25

MR. YOHAI: I believe the witness is just thinking. 11:55:28 11:55:30

MR. ROSS: I'm sorry. Oh, I -- I'm so sorry if that's -- that's the case. 11:55:32 11:55:34

THE WITNESS: I was notified about that particular meeting because Samsung was the one who directed that meeting. The meeting was held initially in English at the beginning. 11:55:43 11:55:43 11:55:47 11:56:02

At the beginning Samsung was arguing with CPT. I -- I left the meeting early. I did not continue my participation in that meeting and they continued on with the meeting. In fact, I was notified to attend this meeting. 11:56:13 11:56:25 11:56:30 11:56:32 11:56:40

I wasn't aware of this particular meeting later on. 11:56:47 11:56:49

BY MR. ROSS: 11:56:49

Q. Isn't it true, sir, that as you continued to go to one-on-one meetings with your competitors, you were aware from those meetings that these group meetings were continuing to happen? 11:56:51 11:56:57 11:57:02 11:57:06

MR. YOHAI: Objection to the form. No foundation. 11:57:23 11:57:25

THE WITNESS: I may not necessarily know that. They may not tell me. 11:57:30 11:57:32

BY MR. ROSS: 11:57:36

Q. But in certainly some of your one-on-one meetings you would be informed of discussions that were had at these group meetings, right, sir? 11:57:36 11:57:38 11:57:43

MR. YOHAI: Objection to the form, no foundation. 11:57:58 11:58:00

THE WITNESS: I was informed; however, I would be told only partial information. I would not know who participated or who attended those meetings, what were discussed, those kind of things. 11:58:13 11:58:17 11:58:21 11:58:27

BY MR. ROSS: 11:58:28

Q. Specifically, generally speaking, wasn't it Mr. Michael Du of Chunghwa who, when he would meet with you, would inform you of certain things that had occurred at these group meetings? 11:58:28 11:58:30 11:58:36 11:58:38

MR. YOHAI: Objection to the form. 11:58:51

THE WITNESS: No. He won't tell me. He would only inform me of selective information. 11:58:57 11:59:06

BY MR. ROSS: 11:59:08

Q. Let me make sure I understand your testimony. You certainly recall meeting with Michael Du of Chunghwa, right, sir? 11:59:10 11:59:12 11:59:15

A. Yes. 11:59:27

Q. And in your meetings with Michael Du, from time to time, not always, he would inform you of at least some of the conversation that had occurred with your other competitors at these group meetings, is that right, sir? 11:59:27 11:59:30 11:59:32 11:59:36 11:59:38

MR. YOHAI: Objection to the form. 12:00:02

THE WITNESS: He would only tell me part of the result. He would not tell me the whole thing. 12:00:12 12:00:13

BY MR. ROSS: 12:00:19

Q. Okay. We've been talking about Mr. Du, he worked for Chunghwa, right, sir? 12:00:19 12:00:21

A. Yes. 12:00:28

Q. I want to ask you about which competitors you met with. So my first question should be the easiest one. I gather you met with Chunghwa from time to time? 12:00:28 12:00:30 12:00:34

A. Yes. 12:00:49

Q. Did you also meet with Samsung from time to time? 12:00:49 12:00:51

MR. CUNNINGHAM: Vague and ambiguous. 12:01:00

THE WITNESS: No. 12:01:00

BY MR. ROSS: 12:01:00

Q. Your answer is no? 12:01:02

A. No. 12:01:04

Q. You never met with Samsung as a competitor of your company? 12:01:04

MR. CUNNINGHAM: Same objection. 12:01:12

MR. YOHAI: Objection, counsel. Are you excluding the one meeting, or never ever any meeting? 12:01:25

MR. ROSS: Well, I am excluding the group meeting. 12:01:27

MR. YOHAI: Okay. 12:01:30

MR. ROSS: I'm now only talking about one-on-one meeting. 12:01:31

MR. YOHAI: You asked. 12:01:34

MR. ROSS: Okay. 12:01:34

MR. YOHAI: Because you already testified. 12:01:34

MR. ROSS: Yeah. Let me -- counsel makes a good point. Don't need to translate that. 12:01:36

BY MR. ROSS: 12:01:38

Q. Other than the group meeting that you attended, where you met -- and we'll talk about that later, which of the companies attended. I'm now talking about any other meetings. 12:01:42

MR. CUNNINGHAM: Object to form. 12:02:15

BY MR. ROSS: 12:02:17

Q. Is it your testimony that other than that one group meeting, you've never met with Samsung as a competitor before? 12:02:17 12:02:19 12:02:23

MR. CUNNINGHAM: Same objection. 12:02:36

THE WITNESS: After the group meeting I did not have any meetings with Samsung. 12:02:45 12:02:47

BY MR. ROSS: 12:02:49

Q. Did you meet with Samsung before the group meeting? 12:02:49 12:02:57

MR. CUNNINGHAM: Object to form. 12:02:58

THE WITNESS: No meetings were held; however, we did see each other at the customer's site. 12:03:00 12:03:04

BY MR. ROSS: 12:03:10

Q. When you saw each other at the customer's site, did you exchange information with Samsung? 12:03:10 12:03:12

MR. CUNNINGHAM: Same objection. 12:03:19

THE WITNESS: No. 12:03:21

BY MR. ROSS: 12:03:23

Q. Did you meet with any other of your competitors for information exchanges other than Chunghwa or at this one group meeting? 12:03:23 12:03:27 12:03:30

A. No. 12:03:43

Q. So it's your testimony that other than the 12:03:45

group meeting Chunghwa is the only competitor that you met with? 12:03:47 12:03:57

A. Correct. 12:04:06

Q. Are you aware of any other colleagues of yours, from your company, that attended these competitor meetings? 12:04:10 12:04:12 12:04:17

MR. YOHAI: Objection, vague. 12:04:30

THE WITNESS: I don't know. 12:04:30

BY MR. ROSS: 12:04:32

Q. Do you know if anybody who you worked with attended competitor meetings other than the group meeting that you attended, or the Chunghwa meetings that you attended? 12:04:32 12:04:36 12:04:38 12:04:42

A. Would you please reask the question? 12:05:06

Q. Certainly. I've been asking questions about you personally attending meetings. I'm now asking about your awareness of any of your colleagues at your company attending other meetings, meetings that you didn't attend to -- attend, but that you were told by your colleagues, yes, they had attended a meeting with Samsung or a different meeting with Chunghwa, are you aware of anything like that? 12:05:08 12:05:10 12:05:13 12:05:15 12:05:19 12:05:21 12:05:25 12:05:28

MR. YOHAI: Objection -- objection to form. 12:05:30

THE WITNESS: No. I am not aware of. 12:06:08

BY MR. ROSS: 12:06:12

Q. How did you first come about to attend competitor meetings with Chunghwa? 12:06:12 12:06:13

A. They notified us. I was also notified by my predecessor of the position I had. 12:06:32 12:06:36

Q. Okay. Who was your predecessor of the position you had? 12:06:42 12:06:42

A. The name is Walid. The English name is called Walid Huang. Walid Huang. 12:06:49 12:06:58

Q. And when you say your predecessor in your position, which of your positions are you talking about? 12:07:08 12:07:10

A. The coordinator job. 12:07:17

Q. What did Mr. Huang tell you about these meetings? 12:07:19 12:07:23

A. Nothing, it's just that the boss wanted me to be responsible for marketing. And I would just be the window of the exchange. 12:07:40 12:07:42 12:07:47

Q. So he told you that part of your job was you were expected to meet with competitors? 12:07:49 12:07:57

MR. YOHAI: Objection. No foundation. Mischaracterizes his testimony. 12:08:10 12:08:10

THE WITNESS: I was just told that the job was like that. 12:08:19 12:08:21

BY MR. ROSS: 12:08:21

Q. Like what, that you were supposed to meet with competitors as part of your job responsibility? 12:08:23 12:08:27

MR. YOHAI: Objection to the form. Mischaracterizes his testimony. 12:08:34 12:08:36

THE WITNESS: Just to collect the information, competitors, is just a part of it. 12:08:47 12:08:51

BY MR. ROSS: 12:08:57

Q. But part of what your predecessor directed you or informed you was part of the job was meeting with competitors to collect information, is that right? 12:08:58 12:09:00 12:09:02

MR. YOHAI: Objection. Mischaracterizes his testimony, you can answer. 12:09:17 12:09:19

THE WITNESS: It's just that to ask me to go and meet with competitors, and that's what I was just told. 12:09:30 12:09:34 12:09:38

BY MR. ROSS: 12:09:38

Q. Okay. And when he said, your predecessor, that the boss expected you to do this, was the boss Mr. Hsu? 12:09:38 12:09:42 12:09:43

A. Correct. 12:10:00

Q. Okay. We're going to go into specific competitor meetings, but I wanted to ask you some general questions about them. At these meetings with competitors with Chunghwa, from time to time, did you exchange current pricing information with them? 12:10:00 12:10:04 12:10:06 12:10:17 12:10:21

A. They would ask for it. My purpose was to obtain the shipment volume of the finished products, 12:10:36 12:10:47

shipment in Taiwan. 12:11:00

MR. ROSS: Objection, nonresponsive. 12:11:02

BY MR. ROSS: 12:11:04

Q. My question wasn't what your purpose is, sir. 12:11:04

My question was: From time to time did you exchange 12:11:06

current pricing information on CRTs with Chunghwa? 12:11:08

A. If CPT asks me, I would tell them. 12:11:38

Q. Okay. And if CPT gave you their current 12:11:43

pricing information in exchange for what they asked from 12:11:47

you, would they do that, would they say you give me mine 12:11:51

and I'll give you your -- strike all that, and ask a 12:11:58

better question. 12:12:02

When they would ask you for current price 12:12:04

information and you would give that to them, would they 12:12:08

also give you their current price information? 12:12:10

A. Not necessarily. 12:12:27

Q. But sometimes they would? 12:12:27

A. Correct. 12:12:28

Q. And sometimes they would give you current 12:12:30

price information from other competitors that they were 12:12:30

aware of, right, sir? 12:12:34

A. I don't recall having that part of the 12:12:45

information. 12:12:47

Q. Okay. And you also exchanged from time to 12:12:47

time future pricing information with competitors, 12:12:49

pricing information for CRTs a month or two months down the road? 12:12:57 12:13:02

MR. CUNNINGHAM: Object to form. 12:13:13

THE WITNESS: I don't recall. 12:13:15

BY MR. ROSS: 12:13:19

Q. And would you also exchange current capacity information with competitors, the amount that they could produce if they were at full capacity, would you exchange that information? 12:13:21 12:13:23 12:13:27 12:13:28

MR. CUNNINGHAM: Same objection. 12:13:30

THE WITNESS: Sometimes. 12:13:51

BY MR. ROSS: 12:13:57

Q. And sometimes would you exchange future capacity information with competitors? 12:13:57 12:13:58

MR. CUNNINGHAM: Same objection. 12:14:00

MR. YOHAI: Objection to the form. 12:14:10

THE WITNESS: I don't quite recall. 12:14:13

BY MR. ROSS: 12:14:17

Q. And from time to time would you exchange current production information of CRTs with these competitors at these meetings? 12:14:19 12:14:21 12:14:23

MR. YOHAI: Objection to the form. 12:14:25

THE WITNESS: I don't quite recall. 12:14:43

BY MR. ROSS: 12:14:43

Q. And what about future production information, 12:14:45

would you exchange future production information at these competitor meetings? 12:14:47 12:14:51

MR. YOHAI: Same objection. 12:15:06

THE WITNESS: I don't recall -- quite recall. 12:15:10

BY MR. ROSS: 12:15:12

Q. And isn't it true, sir, that from time to time at these meetings that you would -- you or your colleagues who attended on -- on behalf of Matsushita, would agree to follow what other competitors had agreed to at group meetings, didn't that happen? 12:15:13 12:15:15 12:15:17 12:15:21 12:15:27

MR. YOHAI: Objection as to Matsushita, and objection as to form. 12:15:28 12:15:32

THE WITNESS: No, because we do not have the authority of pricing or regarding shipment plans. 12:16:15 12:16:17

BY MR. ROSS: 12:16:25

Q. Isn't it true, sir, that at some of these one-on-one meetings with your competitor, Chunghwa, that you would discuss what a bottom price would be, a price at which the competitors would not drop lower than in charging to their customers, didn't that -- didn't that happen? 12:16:25 12:16:27 12:16:30 12:16:34 12:16:38 12:16:40

MR. YOHAI: Objection as to form. 12:17:17

THE WITNESS: No. Because we do not have the authority to decide on pricing. 12:17:19 12:17:23

BY MR. ROSS: 12:17:27

Q. Whether you had the authority or not, did you ever indicate in these meetings to Chunghwa that your company would follow various prices or not go below a bottom price? 12:17:36 12:17:38 12:17:42 12:17:43

A. No. We were not authorized. How can we go and discuss in that regard? 12:18:13 12:18:17

Q. Putting aside whether you were authorized or not, isn't it true that Chunghwa would indicate to you agreements that it had reached with other competitors at group meetings regarding pricing? 12:18:19 12:18:22 12:18:25 12:18:28

MR. YOHAI: Objection to the form. Mischaracterizes the record. 12:18:58 12:18:58

THE WITNESS: They would tell me, but I cannot make a decision. 12:19:08 12:19:10

BY MR. ROSS: 12:19:12

Q. Okay. Have you ever had e-mail communications with an employee of one of your competitors? 12:19:12 12:19:15

A. I don't recall. 12:19:32

Q. Did you ever have phone conversations with employees of one of your CRT competitors? 12:19:34 12:19:36

A. Yes. 12:19:49

Q. Can you tell me about those, please, sir? 12:19:49

A. I don't recall. 12:19:58

Q. About how many times do you think you had phone conversations with your competitors? 12:20:00 12:20:02

A. I do not recall. 12:20:12

Q. Do you recall what the topics of those 12:20:12
conversations were? 12:20:13

A. I would not remember those. 12:20:21

Q. Well, just generally speaking, sir, why would 12:20:23
you be calling or contacting your competitors on the 12:20:27
phone? 12:20:28

MR. YOHAI: Objection to the form. 12:20:40

THE WITNESS: Would you please repeat that? 12:20:42

BY MR. ROSS: 12:20:43

Q. Generally speaking, sir, can you tell us why 12:20:45
you would be having phone conversations with your 12:20:47
competitors? 12:20:49

MR. YOHAI: Same objection. 12:21:02

THE WITNESS: I would not have remembered 12:21:06
those things. 12:21:08

BY MR. ROSS: 12:21:10

Q. When you had communications with your 12:21:10
competitors, either at the meetings you've discussed, or 12:21:12
at the phone calls that you can't recall, what language 12:21:13
would you communicate in? 12:21:17

A. Chinese. 12:21:38

Q. Did you discuss in these competitor meetings 12:21:49
your view of pricing trends in the market? 12:21:57

A. I don't recall. 12:22:13

MR. ROSS: Why don't we break here for lunch. 12:22:19

MR. YOHAI: Yeah, I was thinking the same. 12:22:23

THE VIDEOGRAPHER: Going off the record. The time is 12:22. 12:22:24 12:22:25

- - - 01:27:13

(Whereupon the document was marked, for identification purposes, as Exhibit 2600 and Exhibit 2600-E.) 01:27:13 01:27:13 01:27:13

- - - 01:25:28

THE VIDEOGRAPHER: Back on the record, the time is 1:27. Please continue. 01:27:13 01:27:15

BY MR. ROSS: 01:27:17

Q. Mr. Chang, we're back from the lunch recess. Are you ready to continue? 01:27:19 01:27:21

A. Yes. 01:27:28

Q. Great. I've marked and put in front of you as Exhibit 2600 and 2600-E, Bates stamp CHU 00028521, which is meeting minutes of a 5 -- May 6th, 1996, bilateral meeting between Matsushita and Chunghwa. 01:27:30 01:27:32 01:27:40 01:27:47

Do you have those documents in front of you, sir? 01:27:51 01:27:57

A. Yes. 01:28:23

Q. Do you see in the -- and you can look at the Chinese version, the original version, where it says contact numbers for those who are coming from Taiwan 01:28:25 01:28:27 01:28:32

Matsushita Electric. Do you see the three names there, sir? 01:28:34 01:28:38

A. Yes. 01:28:58

Q. The first name is Chi-Yen Hsu. Is that the name of Mr. Hsu, your boss, that we discussed earlier during the deposition? 01:29:00 01:29:02 01:29:06

A. Yes. 01:29:12

Q. The second one is -- the second one, sir, is "Yu-Hau Chang". Is that yourself? 01:29:13 01:29:17

A. Yes. 01:29:23

Q. And the third person, Yi-Feng Huang. Can you tell us who that is, sir? 01:29:25 01:29:30

A. You mean the third person? 01:29:34

Q. Yes. 01:29:36

A. My colleague. 01:29:38

Q. And is this a gentleman or -- or a lady ma'am -- sir? 01:29:38 01:29:42

A. A gentleman. 01:29:45

Q. A gentleman, okay. And -- and what was his position at your company? 01:29:47 01:29:49

A. He's from the same department. 01:29:58

Q. Was he a superior to you or a subordinate at this point in time? 01:30:00 01:30:04

A. The same. 01:30:10

Q. I'm sorry, "the same" meaning? 01:30:13

A. Same job description. 01:30:21

Q. So at this point in time you were the vice 01:30:21

coordinator or coordinator in 1996, correct, sir? 01:30:27

A. Yes. 01:30:36

Q. And was he also a coordinator? 01:30:38

A. I don't quite recall. 01:30:42

Q. Do you know -- did he report to Mr. Hsu as 01:30:43

well as -- as you did? 01:30:45

A. Correct. 01:30:47

Q. And -- and you did not report to him or he did 01:30:51

not report to you, you guys were on the same level? 01:30:58

A. Correct. 01:31:02

Q. Okay. Does this appear to you to be notes of 01:31:08

a competitor meeting that you attended with Chunghwa? 01:31:10

MR. YOHAI: Objection to form, no foundation. 01:31:21

THE WITNESS: I don't recall. 01:31:28

BY MR. ROSS: 01:31:28

Q. Do you recall attending this meeting? 01:31:28

A. I don't recall. 01:31:30

Q. Do you have any reason to doubt that you 01:31:32

attended this meeting? 01:31:34

A. Any reasons, I don't quite recall about this. 01:31:45

Q. Okay. I want to direct your attention on the 01:31:47

Chinese to where it says, A -- towards the top of that 01:31:49

first page. And I'll read from the English translation, 01:31:57

since I don't know Chinese, but you can tell me if there's a problem with the translation. 01:32:08 01:32:10

It says, MEC's -- "MEC's current CDT production status (Beijing Matsushita excluded)" do you see that? 01:32:12 01:32:15 01:32:23

A. Yes. 01:32:25

Q. And was it typical for when you were at these meetings with your competitor, Chunghwa, for you to give that type of production status information that is listed there? 01:32:25 01:32:28 01:32:32 01:32:38

MR. YOHAI: Objection to the form of the question. 01:32:57 01:32:57

THE WITNESS: I don't quite recall. 01:32:58

BY MR. ROSS: 01:33:00

Q. If you don't recall specifically from this meeting, do you recall that it was typical to exchange that type of production status information? 01:33:02 01:33:04 01:33:06

MR. YOHAI: Objection to the form. 01:33:10

THE WITNESS: Not necessarily. 01:33:25

BY MR. ROSS: 01:33:27

Q. If you turn under -- in the Chinese in the line under the 20/21 inches, where -- on that page. Right at -- where it says "Starting in June, new Malaysia 15-inch production line will be added, therefore, capacity for 15-inch will be" -- and then it 01:33:28 01:33:30 01:33:42 01:33:43 01:33:47

shows what the capacity will be? 01:33:49

A. I'm reading it now, yes. 01:34:17

Q. And -- and is that typical that at some of the meetings where you had information exchanges with your competitor, Chunghwa, that future production capacity would be discussed? 01:34:19 01:34:23 01:34:25 01:34:28

MR. YOHAI: Objection to form. 01:34:40

THE WITNESS: I don't quite recall about this, regarding this. 01:34:51 01:34:51

BY MR. ROSS: 01:34:57

Q. Okay. If you then look at B, B as in boy, on the Chinese, there is a Roman Numeral I and then a Roman Numeral II. And if you see that the Roman Numeral II says: Current 15-inch market price (based on Matsushita's date -- Taiwan Matsushita Electronics' visit to customers). 01:34:57 01:35:02 01:35:06 01:35:10 01:35:13 01:35:19

Do you see that, sir? 01:35:21

A. I see it. 01:35:40

Q. And do you then see following that a table of various market prices that competitors are offering based on the information that Matsushita got from its visit to its customers? 01:35:42 01:35:43 01:35:49 01:35:58

MR. YOHAI: Objection, no foundation. 01:36:17

THE WITNESS: I see them. 01:36:23

BY MR. ROSS: 01:36:25

Q. Okay. And was it typical at these meetings for you or your boss or your colleague, colleagues who were there, to share the pricing information you had received from your customers with your competitor? 01:36:25 01:36:28 01:36:32 01:36:36

MR. YOHAI: Objection -- objection to the form. 01:36:38 01:36:40

THE WITNESS: I don't quite recall about this. 01:37:13

BY MR. ROSS: 01:37:13

Q. Okay. If you could turn to the second page of the Chinese, right at the top, it says -- I'm reading the translation: For prices for all makers to stabilize, wait for the market to recover in July and August, and then reduce prices according to actual condition in order to stimulate demands. 01:37:15 01:37:17 01:37:27 01:37:28 01:37:30 01:37:34

Do you see that, sir? 01:37:36

A. Yes. 01:38:13

Q. Now, can you explain for us, sir, what was being discussed that that comment was referring to? 01:38:15 01:38:17

MR. YOHAI: Objection, no foundation. 01:38:28

THE WITNESS: I don't recall about the discussion. Did you want me to explain based on what is written here? 01:38:38 01:38:40 01:38:42

BY MR. ROSS: 01:38:43

Q. Please. 01:38:43

MR. YOHAI: Objection. 01:38:45

THE WITNESS: The article describes that we will follow the market demand to expend the demand. 01:39:00 01:39:04

BY MR. ROSS: 01:39:10

Q. To expend? 01:39:10

A. To follow the market pricing so that we can obtain more orders. 01:39:13 01:39:17

Q. And -- and by "we", was that Matsushita or both Matsushita and Chunghwa? 01:39:19 01:39:23

MR. YOHAI: Objection to "Matsushita". Vague as to "Matsushita". 01:39:32 01:39:40

THE WITNESS: By looking at this document within context of what's said before and after, it is referring to the hope of MEC. Based on what is written in this document, which was written by MEC, MEC's hope was to follow the market pricing and then make adjustment of the pricing in order to stimulate the demand. 01:39:51 01:39:58 01:40:04 01:40:27 01:40:32 01:40:40 01:40:45

CHECK INTERPRETER: Check interpreter's clarification. 01:40:47 01:40:49

Based on what is written in this document, it was MEC's hope to follow the market price and then drop the price to stimulate the demand. 01:40:51 01:40:57 01:41:02

THE INTERPRETER: Interpreter will stand by her interpretation because the witness did not say the word "reduce". 01:41:06 01:41:08 01:41:10

MR. ROSS: Okay. 01:41:12

THE INTERPRETER: But "adjust". 01:41:13

MR. YOHAI: I think they're different -- 01:41:13

excuse me, I'm sorry, you had interpreted "which was 01:41:13

written by MEC". I think that's part of the issue. I 01:41:15

don't know if the interpreter heard that or not. I 01:41:19

don't believe that's what he said, but I -- it's up to 01:41:21

the interpreter. 01:41:23

BY MR. ROSS: 01:41:25

Q. Was it typical in this -- when you were at 01:41:25

these meetings for you or your colleagues to share 01:41:30

Matsushita's future pricing plans in the manner that we 01:41:36

see in Exhibit 2600? 01:41:40

A. I don't quite recall. 01:42:12

Q. Mr. Chang, in looking at the document, I do 01:42:13

not see any information regarding the plans of Chunghwa 01:42:15

to ship finished products or any type of finished 01:42:21

product information in here. 01:42:25

Do you see anything like that? 01:42:28

A. It's not here; however, it would be their red 01:43:00

go (ph) -- it would be their information on their own. 01:43:12

It's not recorded here. 01:43:15

Q. Right. I mean, and -- and you have no 01:43:17

recollection for this meeting of obtaining any 01:43:19

information regarding shipments of finished products 01:43:21

from Chunghwa, do you, sir? 01:43:25

A. I don't quite recall about this. Since the 01:43:40

information was their own records on their own side, so 01:43:45

I do not know what is the purpose for their own record 01:44:02

because this is not their own record. 01:44:06

Q. But there's no indication in this record, in 01:44:08

their record, that any such information was provided to 01:44:12

Matsushita, correct, sir? 01:44:15

MR. YOHAI: Objection to "Matsushita". 01:44:30

THE WITNESS: I do not know about that. 01:44:36

MR. YOHAI: Counsel, if we could agree on MEC, 01:44:38

I think it would save me every time from having to say 01:44:40

"Matsushita". 01:44:43

MR. ROSS: What do you -- what do you want to 01:44:45

agree on? 01:44:47

MR. YOHAI: Just say -- if you say MEC, I 01:44:47

won't have to -- 01:44:47

MR. ROSS: MEC? M-E-C? 01:44:49

MR. YOHAI: M-E-C, yeah. 01:44:51

MR. ROSS: Okay. Well, that's fine. 01:44:51

BY MR. ROSS: 01:44:57

Q. Well, sir, as we go through these documents, 01:44:58

and I'll represent to you I don't see any discussion in 01:45:00

any of these documents that reflect these meetings you 01:45:02

had of finished products, volumes, or anything touching 01:45:04

on that, I'm more than happy for you to point out that I'm wrong, if -- if you see it, and I'll continue to ask you if it's in there, but if I am wrong, please correct me. Okay, sir? 01:45:08 01:45:12 01:45:13 01:45:17

A. All right. 01:46:04

Q. Okay. You can put the document aside. Before we move to the next one, this is the earliest document I've seen with your name on it. Is this roughly the time period, May of '96, that you started attending competitor meetings? 01:46:04 01:46:08 01:46:12 01:46:13 01:46:17

A. Possibly, but I do not quite recall. 01:46:43

Q. You said earlier that your predecessor told you about attending competitor meetings, that it was something that your boss would want you to do. Whether it was this meeting or some other meeting, do you recall how it came about that you first attended a competitor meeting? 01:46:47 01:46:51 01:46:58 01:47:00 01:47:04 01:47:06

MR. YOHAI: Objection to the extent it may mischaracterize his testimony. You can answer. 01:47:08 01:47:10

THE WITNESS: I do not recall the detail situation back then. 01:47:47 01:47:49

BY MR. ROSS: 01:47:51

Q. Do you recall if the request came from your boss or from somebody from Chunghwa calling you, do -- can you give us some sense of how you first became 01:47:51 01:47:57 01:48:00

involved in these meetings? 01:48:04

A. Someone requested me. However, I do not he 01:48:27

recall who that person was. 01:48:28

Q. Do you recall -- and when you say someone 01:48:30

requested you, do you recall if that was someone at MEC, 01:48:32

or someone at your company in Taiwan, or one of your 01:48:38

competitors asking you to attend? 01:48:45

A. I don't recall. 01:49:06

Q. Okay. Get the next one, please. 01:49:08

- - - 01:49:15

(Whereupon the document was marked, 01:49:15

for identification purposes, as 01:49:15

Exhibit 2601 and Exhibit 2601-E.) 01:49:15

- - - 01:49:12

BY MR. ROSS: 01:49:13

Q. Sir, I'm handing you what's been marked as 01:49:13

2601 and 2601-E. 01:49:17

MR. ROSS: Need one for the translator. 01:49:19

BY MR. ROSS: 01:49:23

Q. And while that is being passed around the 01:49:23

table, I will identify it for the record as 01:49:27

CHU 00028516, minutes of a July 17, 1996, bilateral 01:49:27

meeting that your company had with Chunghwa. 01:49:42

Tell me when you had a chance to look at that 01:50:21

and I'll ask you some questions. 01:50:23

MR. YOHAI: Counsel, while he's reading, I'm just going to clip these together so we don't lose track of what goes with what. 01:51:58 01:52:00 01:52:04

MR. ROSS: I like doing them as one exhibit. 01:52:08

MR. YOHAI: Yeah. 01:52:08

MR. ROSS: Others don't. 01:52:12

MR. YOHAI: You'll have a pile and then no one will be able to figure out what goes with what. 01:52:08 01:52:12

BY MR. ROSS: 01:52:12

Q. And, Mr. Chang, when I ask you to look over a document, feel free to read the whole document, or if you just want to scan it and I will direct you to the parts I'm interested in, we can do that. It's whatever you feel most comfortable with. 01:52:12 01:52:15 01:52:17 01:52:19 01:52:23

A. Since the handwriting is quite messy, I have to really put some effort in reading. 01:52:45 01:52:47

Q. I appreciate the effort and I agree it is awful messy. 01:52:51 01:52:57

Are you ready, or do you still need more time? 01:52:58

A. It's okay. You can start. 01:53:06

Q. Okay. This is a meeting a couple of months after the May meeting. Do you see under the contacted personnel at the top there it has both yourself and Mr. Hsu attending for MEC? 01:53:08 01:53:10 01:53:13 01:53:17

A. I don't think this is MEC. It's referring to 01:53:47

the Taiwan sales -- 01:53:49

Q. Okay. 01:53:57

A. -- office. 01:53:57

Q. With that correction, attending for Taiwan 01:53:58

Matsushita Electronics, do you see that it's yourself 01:54:00

and Mr. Hsu? 01:54:04

A. Yes. 01:54:15

Q. Was it generally the case when you met with 01:54:17

Chunghwa at these competitor meetings that Mr. Hsu also 01:54:19

attended? 01:54:23

A. I don't recall about this meeting. 01:54:36

Q. My question was more general. Generally, when 01:54:40

you went and met at competitor meetings, is it generally 01:54:42

the case that Mr. Hsu of your office, your boss, also 01:54:47

attended? 01:54:51

A. I don't quite recall about that. 01:55:15

Q. Okay. By the way, is Mr. Hsu still with your 01:55:17

company? 01:55:19

A. Yes. 01:55:23

Q. Does he work in the Taipei office? 01:55:25

A. Yes. 01:55:27

Q. What is his current position? 01:55:27

A. President. 01:55:36

Q. Okay. I want you to take a look -- or let me 01:55:38

direct your attention on the Chinese page, the -- 01:55:40

towards the bottom you'll see a B in parentheses and I want to ask you about the -- the couple of lines right above that. 01:55:47 01:55:51 01:55:57

A. Mm-hmm. 01:56:06

Q. And right above that, it's talking about the market demand for wide TV being good in Japan, that Matsushita occupies a share of about 80 percent, that's the start of that bullet point, do you see that? Above the B. 01:56:08 01:56:10 01:56:13 01:56:17 01:56:19

A. Yes. 01:56:40

Q. Okay. The -- at the end of that paragraph, it says in translation: So when CDT is experiencing falling" -- falling demand -- "part of the original CDT production capacity can be converted to produce wide/large size CPT". 01:56:42 01:56:43 01:56:47 01:56:51 01:56:58

Do you see that, sir? 01:57:04

A. Yes, I see it. 01:57:32

Q. And do you recall that to be generally the case from your position at the company, that MEC could switch its production lines between CDT and CPT as necessary? 01:57:32 01:57:34 01:57:38 01:57:42

MR. YOHAI: Objection to the form of the question. No foundation. 01:58:04 01:58:06

THE WITNESS: I would not be able to see that from my position. 01:58:13 01:58:15

BY MR. ROSS: 01:58:15

Q. Well, do you recall giving that information to your competitor, Chunghwa, in this meeting in July of '96? 01:58:17 01:58:19 01:58:23

A. I don't recall. 01:58:36

Q. And do you have any reason to doubt that, in fact, that information was given since it was recorded by the other attendees of the meeting? 01:58:38 01:58:42 01:58:43

MR. YOHAI: Objection to the form. Mischaracterizes the document. 01:59:10 01:59:12

THE WITNESS: I do not know. Therefore, I cannot speculate. 01:59:15 01:59:15

BY MR. ROSS: 01:59:17

Q. Okay. And is there anything in this Exhibit 2601 that indicates that Mat- -- that your company was obtaining CRT finished product shipping information or any other information on CRT finished products? 01:59:17 01:59:21 01:59:27 01:59:32 01:59:36

A. From this document? 02:00:06

Q. Correct. 02:00:06

A. On here it says for the months of July, August and September, and there is some product in inventory, that was referring to the finished product in inventory. 02:00:21 02:00:25 02:00:30

Q. Where does it say fin- -- when you say "finished product", are you talking about CRTs? 02:00:36 02:00:38

A. It says here the current customer, our customer refers to finished goods customer. 02:00:51 02:01:04

Q. It says with -- here -- here's what I have, and tell me if it's wrong, it says: With regard to market recovery, based on the calculations of its current customers' inventory output or order volume in July, August, September, the inventory of 15-inch/17-inch in September should drop to a reasonable level. 02:01:12 02:01:13 02:01:17 02:01:19 02:01:23 02:01:25 02:01:28

Do you see that, sir? 02:01:28

A. Would you please repeat that? 02:02:10

MR. ROSS: Would you read it back. 02:02:12

THE INTERPRETER: Perhaps the interpreter can reinterpret this part? 02:02:15 02:02:15

MR. ROSS: You're saying -- are you saying the translation is off? 02:02:21 02:02:23

THE INTERPRETER: No. The interpreter was just offering, instead of reading through the entire paragraph, maybe -- perhaps the interpreter can just reinterpret the paragraph. 02:02:25 02:02:25 02:02:28 02:02:30

MR. YOHAI: Why don't we just have a question and an answer, rather than -- 02:02:32 02:02:34

MR. ROSS: Yeah. 02:02:34

MR. YOHAI: -- reinterpreting the paragraph. 02:02:34

MR. ROSS: Yeah, I think we need to do it that 02:02:36

way. If you can just read back my question. 02:02:38

- - - 02:04:13

(The court reporter read back as 02:04:13
follows: 02:04:13
"QUESTION: It says with -- here -- 02:01:12
here's what I have, and tell me if it's 02:01:13
wrong. It says: With regard to market 02:01:13
recovery, based on the calculations of 02:01:17
its current customers' inventory output 02:01:17
or order volume in July, August, 02:01:21
September, the inventory of 02:01:23
15-inch/17-inch in September should drop 02:01:25
to a reasonable level. 02:01:28
"Do you see that, sir?") 02:01:30

- - - 02:03:08

THE WITNESS: Yes. 02:04:06

BY MR. ROSS: 02:04:06

Q. And that refers to CRTs, that inventory, not 02:04:06
CRT finished products, right, sir? 02:04:12

MR. YOHAI: Objection, that mischaracterizes 02:04:17
the document. 02:04:17

THE WITNESS: This is referring to the 02:04:28
finished goods inventory. It could be referring to the 02:04:28
finished goods. 02:04:34

BY MR. ROSS: 02:04:34

Q. It could be, or it is? 02:04:34

A. It's not very detailed. 02:04:40

MR. YOHAI: Objection. 02:04:42

THE WITNESS: It's talking about our customer. 02:04:51

The monitor manufacturers' inventory did not specify any 02:04:57

others. 02:05:02

BY MR. ROSS: 02:05:04

Q. Okay. 02:05:04

MR. ROSS: Next one is 28507. 02:05:12

For the record, as we're passing these around, 02:05:43

the next document is Exhibits 260-T -- 2602 and 2602-E, 02:05:45

Bates stamp is CHU 00028507, and these are minutes of a 02:05:57

bilateral meeting between Taiwan Matsushita Electronic 02:06:04

and Chunghwa, dated March 4th, 1997. 02:06:12

- - - 02:06:15

(Whereupon the document was marked, 02:06:15

for identification purposes, as 02:06:15

Exhibit 2602 and Exhibit 2602-E.) 02:06:15

- - - 11:15:21

BY MR. ROSS: 02:06:15

Q. Sir, please take a look at that and let me 02:06:43

know when you're ready. 02:06:47

(Sotto voce discussion off the record.) 02:08:15

THE WITNESS: Okay. 02:08:40

BY MR. ROSS: 02:08:40

Q. Okay. Sir, if you could look again towards up the top of the original, where it lists the customers' names of the individuals, from Taiwan Matsushita Electronics, do you see your name there? 02:08:40 02:08:45 02:08:47 02:08:51

A. Yes. 02:09:06

Q. You also see the name, they give him a title of Section Chief, Zhi-Yan Xu? 02:09:08 02:09:10

A. Yes. 02:09:21

Q. Who is Mr. Xu? 02:09:21

A. That is a translation issue. This is referring to Mr. Hsu. 02:09:32 02:09:36

Q. It is referring to Mr. Hsu, okay. 02:09:36

A. The title is wrong too. 02:09:42

Q. Okay. Thank you, sir. 02:09:43

In your reviewing these minutes, does this cause you to refresh your recollection about attending this March 4th, 1997, meeting with your competitor, Chunghwa? 02:09:57 02:09:58 02:10:02 02:10:08

A. No, I don't recall about this specific meeting. 02:10:28 02:10:32

Q. As you'll see in the next document that we look at, this meeting was eight days before the group meeting that we've touched upon and that you do recall. 02:10:34 02:10:36 02:10:40

Does that help refresh your recollection of attending a bilateral one-on-one meeting with Chunghwa 02:10:43 02:10:47

about a week before you attended that group meeting? 02:10:51

A. No, I do not. 02:11:28

Q. Okay. I want to ask you about the paragraphs 02:11:30

in the original document that are labeled 2 and 3 on 02:11:34

that first page. Do you see those? 02:11:38

A. Yes. 02:11:51

Q. Paragraph 2 starts: Recently SDD has been to 02:11:51

Japan and indicated to MEC that because of the poor 02:11:58

market situation, and also due to its own loss, SDD -- 02:12:02

SDD has decreased, and then it's "[Inserted: 'monthly 02:12:06

production'] by 20 percent and would also adjust the 02:12:12

sales price for 14/15-inch to hold the price." 02:12:13

Do you see that, sir? 02:12:17

A. Yes. 02:12:49

Q. Okay. Do you recall either yourself or 02:12:49

Mr. Hsu reporting about this information regarding a 02:12:51

contact between STD and MEC to Chunghwa at this meeting? 02:13:00

A. I don't recall. 02:13:30

THE VIDEOGRAPHER: Let me ask him to put 02:13:32

his -- your mic higher. Thanks. 02:13:34

MR. ROSS: Have you been getting it? 02:13:38

THE VIDEOGRAPHER: Oh, yes. 02:13:40

BY MR. ROSS: 02:13:42

Q. As a general rule, do you recall times when 02:13:42

you and Mr. Hsu at Panasonic Sales of Taiwan would 02:13:43

receive information from MEC in Japan about competitor contacts they -- that they had had with competitors regarding the CRT industry? 02:13:49 02:14:00 02:14:04

MR. YOHAI: Objection to the form of the question. 02:14:06 02:14:06

THE WITNESS: I don't recall. 02:14:43

BY MR. ROSS: 02:14:43

Q. It may have happened, you just can't remember it as you sit here? 02:14:45 02:14:45

MR. YOHAI: Objection, mischaracterizes his testimony. 02:14:47 02:14:49

THE WITNESS: I cannot speculate on that. 02:15:00

BY MR. ROSS: 02:15:02

Q. Do you have any other explanation for the information that's contained here in this second paragraph that is being conveyed to Chunghwa, other than that it came from MEC to you all in Taiwan and you conveyed it? 02:15:06 02:15:10 02:15:12 02:15:19 02:15:23

MR. YOHAI: Objection, no foundation. 02:15:45

THE WITNESS: Would you please rephrase the question? I don't quite understand. 02:15:51 02:15:57

BY MR. ROSS: 02:15:57

Q. Certainly. Can you give us any other reason why you or Mr. Hsu were conveying this information about a competitor meeting between Samsung Display Devices and 02:15:58 02:16:00 02:16:06

MEC in Japan other than that your contacts at MEC were telling you this information? 02:16:10 02:16:13

MR. YOHAI: Objection, no foundation, mischaracterizes his testimony. 02:16:47 02:16:47

THE WITNESS: From the statement reflected here, it does not necessarily mean that the information came from MEC. 02:17:04 02:17:08 02:17:12

Excuse me, it may not necessarily be us who conveyed the information to them. 02:17:17 02:17:21

BY MR. ROSS: 02:17:23

Q. Who else would it be? 02:17:25

MR. YOHAI: Objection, calls for speculation. 02:17:27

THE WITNESS: CPT could get the information from Samsung as well, but I cannot speculate on that. 02:17:34 02:17:36

BY MR. ROSS: 02:17:42

Q. You think that this may indicate that Chunghwa was telling you that Samsung and MEC had had a competitor meeting? 02:17:42 02:17:43 02:17:49

A. I cannot speculate on that. But looking at this document, it may not necessarily came from us. It's possible. 02:18:08 02:18:12 02:18:19

Q. Okay. Finishing up with this paragraph 2, it says, "In the meantime for 17 inches, it" -- meaning Samsung -- "would not engage in vicious competition with price cutting. SDD very much hoped MEC would take more 02:18:21 02:18:25 02:18:28 02:18:32

cooperative actions to stabilize prices." 02:18:38

Do you see that, sir? 02:18:40

MR. CUNNINGHAM: Object to form. 02:18:43

THE WITNESS: Yes, I see it. 02:19:19

BY MR. ROSS: 02:19:21

Q. Does that refresh your recollection at all of you or Mr. Hsu informing Chunghwa of what Samsung had been requesting of MEC with regard to taking cooperative actions to stabilize prices? 02:19:21 02:19:25 02:19:28 02:19:32

MR. CUNNINGHAM: Object to form. 02:19:34

THE WITNESS: I do not know by looking at this, I don't know. 02:20:06 02:20:08

BY MR. ROSS: 02:20:10

Q. Okay. Turn to a third paragraph, the paragraph that says 3. 02:20:10 02:20:13

A. May I ask for a break? 02:20:15

Q. Certainly. 02:20:17

A. Ten minutes? 02:20:21

THE VIDEOGRAPHER: Going off the record. 02:20:23

MR. ROSS: Sure. 02:20:24

THE WITNESS: I'm going to change the DVD. This marks the end of Volume I, media number two in the deposition of Yu-Hao Zhang, a/k/a Allen Chang. The time is 2:20 p.m. We're off the record. 02:20:25 02:20:28 02:20:28 02:20:30

(Recess taken.) 02:29:17

THE VIDEOGRAPHER: We are back on the record at 2:29 p.m. This marks the beginning of Volume I, media number three, of Yu-Hao Zhang a/k/a Allen Chang. Please continue. 02:29:17 02:29:19 02:29:21 02:29:27

BY MR. ROSS: 02:29:27

Q. Mr. Chang, are you ready to continue? 02:29:27

A. Yes. 02:29:30

Q. You can return back to Exhibit 2602. We were going to talk about the paragraph that's numbered 3 on the original as well as the translation. Do you see that, sir? 02:29:30 02:29:34 02:29:38 02:29:40

A. Yes. 02:29:51

Q. Sir, the first sentence reads, "CPT indicated that it had started to reduce working days since the end of last year to decrease the supply and to hold prices." 02:29:57 02:29:58 02:30:02

Do you recognize that CPT in that sentence stands for Chunghwa, the competitor, you were meeting with? 02:30:06 02:30:10 02:30:12

A. I believe so. 02:30:30

Q. Does this refresh your recollection, sir, that from time to time at the meetings that you attended with Chunghwa that the concept of reducing supply, decreasing supply in order to hold prices steady was discussed, again, from time to time? 02:30:32 02:30:34 02:30:40 02:30:42 02:30:45

A. I don't recall. 02:31:21

Q. As you sit here today with regard to all of your competitor contacts, you don't recall the issue of reducing supply as a way of holding or increasing the prices of CRTs being discussed? 02:31:21 02:31:23 02:31:27 02:31:30

A. I don't recall. What I'm more clear about is that we do not have the authority to discuss or determine our pricing. 02:32:08 02:32:10 02:32:15

Q. Do you recall ever leaving a competitor's meeting because a topic was brought up and you felt you didn't have the authority to discuss it? 02:32:17 02:32:21 02:32:23

A. I don't recall. 02:32:43

Q. In these minutes that we're looking at here, paragraphs 2 and 3, and -- and feel free to look beyond that if you want, is there any indication that you informed Chunghwa that you didn't have authority to discuss pricing or agree on pricing and -- and hence, did not want to talk about any of the topics that are listed in this meeting minutes? 02:32:45 02:32:47 02:32:51 02:32:57 02:32:58 02:33:02 02:33:06

A. I don't see it here. However, these are their internal records; therefore, it does not mean I did not mention it. However, this is just their records. 02:34:04 02:34:06 02:34:12

Q. Do you recall in any of your meetings specifically mentioning that there was a subject that was being discussed that you could not discuss with your competitors? 02:34:15 02:34:19 02:34:21 02:34:25

A. I don't recall about that. 02:34:43

Q. Okay. Continuing with the second sentence of 02:34:45
paragraph 3, it says, "Hopefully the wait-and-see 02:34:47
attitude towards the market will be eliminated, and 02:34:49
normal demand will recover. Only in this way can 02:34:51
reasonable production and sales activities be resumed." 02:35:00

Did you see that, sir? 02:35:02

A. Yes. 02:35:40

Q. And finally, the last sentence says, "Also 02:35:42
asked MEC to please coordinate with Beijing Matsushita 02:35:43
so as not to disrupt the market order anymore by cutting 02:35:49
prices for sales," period. 02:35:57

Do you see that, sir? 02:35:58

A. Yes. 02:36:25

Q. What company was Beijing Matsushita? 02:36:25

A. Beijing MEC. 02:36:30

Q. Did it produce CRTs? 02:36:32

A. Yes, they also produce CDT. 02:36:38

Q. And do you recall Chunghwa asking you to 02:36:42
please coordinate with Beijing Matsushita for them to 02:36:49
not disrupt the market order anymore by cutting prices 02:36:57
for sales? 02:37:00

A. I do not recall; however, we were not 02:37:17
responsible for the sales of Beijing MEC. 02:37:23

Q. I understand that you were not -- that you 02:37:28

were not their sales agent. My question is rather more along the lines of did you pass the message along, and I gather your answer is you just don't recall? 02:37:30 02:37:36 02:37:38

A. I don't think so because we do not have a window. 02:38:12 02:38:13

Q. A window? 02:38:15

A. Contact window. 02:38:19

Q. With Beijing Matsushita? 02:38:19

A. Correct. 02:38:23

Q. Did you have a contact window with MEC in Japan? 02:38:27 02:38:28

A. I don't recall. 02:38:34

Q. You don't recall if you had the ability to contact MEC in Japan? 02:38:36 02:38:38

A. No. I don't recall having contacted MEC regarding the matter mentioned here with Beijing MEC. 02:38:47 02:38:58

Q. Okay. That I understand, that you don't recall that. It's -- certainly if you wanted to pass along the message, you could pass it along either directly to Beijing Matsushita or through MEC in Japan; right, sir? 02:39:04 02:39:06 02:39:10 02:39:13 02:39:17

MR. YOHAI: Objection, calls for speculation. 02:39:34

THE WITNESS: That's correct, as I explained before, I do not have a contact window with Beijing MEC. Nor can I speculate on whether I have contacted MEC 02:39:45 02:39:47 02:40:10

regarding the topic having to do with Beijing MEC. 02:40:15

BY MR. ROSS: 02:40:19

Q. You don't know one way or the other if you did 02:40:21

or not? 02:40:23

A. I do not recall. 02:40:27

Q. Okay. You can put that away, sir. 02:40:27

- - - 02:40:30

MR. ROSS: The next -- as I'm passing them 02:40:34

along, the next document is going to be previously 02:40:34

marked as Exhibit 1857 and 1857-E. It's CHU 00028755, a 02:40:38

March 12th, 1997, meeting minutes of a group meeting 02:40:47

amongst Chunghwa, Samsung, LG, Daewoo, Philips, Hitachi 02:40:57

and Matsushita. 02:41:04

BY MR. ROSS: 02:41:38

Q. Sir, take a look at the document and when you 02:41:38

have finished reviewing it to your satisfaction, let me 02:41:40

know so we can continue. 02:41:42

Okay. Mr. Chang, a couple of predicate 02:44:13

questions first. And this is a yes or no question: Did 02:44:15

you review any documents in preparation for this 02:44:21

deposition? 02:44:25

A. Yes. 02:44:25

Q. And did any of those documents refresh your 02:44:47

recollection about events regarding the CRT business in 02:44:49

the time period we've been discussing? 02:44:57

A. No. I would not specifically try to recall any particular meeting. So much time has lapsed. 02:45:12 02:45:21

Q. Let me ask it this way, sir: You remembered -- is -- is this Exhibit 1857 minutes of the group meeting that you recalled and testified about before the lunch break this morning? 02:45:27 02:45:28 02:45:36 02:45:40

A. Yes. 02:45:57

Q. And did you review minutes of that meeting as part of your deposition preparation? 02:45:57 02:46:00

MR. YOHAI: I'm going to object to that question. That does begin to impinge upon work product and attorney-client privilege so I'm going to instruct him not to answer that question. 02:46:08 02:46:10 02:46:13 02:46:15

BY MR. ROSS: 02:46:17

Q. Let me ask this, have you ever seen this document that's been numbered as Exhibit 1857 before? 02:46:17 02:46:19

MR. YOHAI: I would exclude from your answer any information that we went over in the course of our meetings with your attorneys. 02:46:38 02:46:40 02:46:45

THE WITNESS: I don't understand what that -- what does that mean. 02:47:10 02:47:12

MR. YOHAI: Other than in preparation, don't talk about any documents we looked at in preparation. Have you ever seen it, other than potentially in preparation? 02:47:13 02:47:15 02:47:17 02:47:21

THE WITNESS: I had discussions with my attorney. 02:47:49 02:47:51

MR. YOHAI: Yeah, don't -- don't -- can I confer with the witness? 02:47:51 02:47:57

MR. ROSS: Yeah. 02:47:58

THE VIDEOGRAPHER: Going off the record. The time is 2:48. 02:48:00 02:48:00

(Recess taken.) 02:49:42

THE VIDEOGRAPHER: Back on the record. The time is 2:50. Please continue. 02:49:43 02:49:43

THE WITNESS: All right. 02:49:49

MR. ROSS: I think there was a pending question. If you could read it back, please sir. 02:49:49 02:49:51

- - - 02:50:12

(The court reporter read back as follows: 02:50:12 02:50:12

"QUESTION: Let me ask this, have you ever seen this document that's been numbered as Exhibit 1857 before?") 02:50:12 02:50:12 02:50:12

- - - 02:50:06

MR. YOHAI: Same objection. Please exclude any information you have in preparation with counsel. 02:50:08 02:50:10

THE WITNESS: I did not see this document before. 02:50:28 02:50:30

BY MR. ROSS: 02:50:32

Q. Okay. Sir, you testified earlier today that at the glass meeting Samsung and CPT had a disagreement, Samsung and Chunghwa had a disagreement, do you recall that, sir? 02:50:32 02:50:38 02:50:43 02:50:45

MR. YOHAI: Objection. Counsel, I'm just going to object if you say "at the glass meeting". 02:50:45 02:50:47

MR. ROSS: At the group meeting, I'm sorry. 02:50:47

MR. YOHAI: That's okay. Okay. Maybe we'll get a clean question. 02:50:51 02:50:57

BY MR. ROSS: 02:50:58

Q. You testified earlier today that at this group meeting in 1997 that Samsung and Chunghwa had a disagreement. Do you recall that, sir? 02:50:58 02:51:02 02:51:08

MR. CUNNINGHAM: Object to form. 02:51:21

THE WITNESS: Would you please reinterpret the question. 02:51:30 02:51:32

BY MR. ROSS: 02:51:32

Q. You testified earlier today that Samsung was arguing with Chunghwa at this group meeting that you attended in March of 1997. Do you recall that, sir? 02:51:34 02:51:36 02:51:38

MR. CUNNINGHAM: Same objection. 02:51:42

THE WITNESS: Yes. 02:52:02

BY MR. ROSS: 02:52:02

Q. Okay. Before this week, before you met with your counsel, did you recall that at that group meeting 02:52:04 02:52:06

Samsung and Chunghwa were arguing? 02:52:10

MR. CUNNINGHAM: Same objection. 02:52:28

THE WITNESS: Yes, I do. 02:52:30

BY MR. ROSS: 02:52:32

Q. Okay. You testified earlier -- well, strike that. If you look at the first page of the report, am I correct that you are the only person listed as attending for Matsushita? 02:52:32 02:52:36 02:52:40 02:52:43

A. Correct. 02:52:58

Q. And is -- does that comport with your memory, do you recall being the only representative from Matsushita at the meeting? 02:53:00 02:53:04 02:53:06

A. I believe so. 02:53:19

Q. You testified this morning that somebody from Samsung contacted you about attending this meeting. Do you recall that, sir? 02:53:19 02:53:21 02:53:25

MR. YOHAI: Objection to the form. 02:53:36

THE WITNESS: That's not what I said. I said someone notified me. 02:53:43 02:53:45

BY MR. ROSS: 02:53:47

Q. Then tell me, first of all, do you recall who at Samsung notified you about the meeting? 02:53:47 02:53:49

MR. YOHAI: Objection, counsel. He -- 02:53:51

MR. ROSS: Did I -- 02:53:57

MR. YOHAI: Mischaracterizes -- to the extent 02:53:57

it mischaracterizes his testimony. He can answer. 02:53:58
MR. CUNNINGHAM: Vague and ambiguous. 02:54:13
THE WITNESS: What I said was Samsung was 02:54:19
leading this meeting. 02:54:21
BY MR. ROSS: 02:54:23
Q. Let's take it back a step. How did you find 02:54:25
out about the fact that this meeting was going to 02:54:27
happen? 02:54:28
A. Someone notified me. 02:54:32
Q. Who notified you? 02:54:34
A. I don't recall. 02:54:38
Q. From what company? 02:54:40
A. I don't recall. 02:54:42
Q. Was it from a Matsushita affiliated company, 02:54:43
or from a competitor, what can you tell us about -- 02:54:49
MR. YOHAI: Objection. 02:54:57
BY MR. ROSS: 02:54:57
Q. -- how you found out about the meeting? 02:54:57
MR. YOHAI: Objection. Asked and answered 02:54:58
this morning and just now. 02:55:00
THE WITNESS: I don't want to speculate. I do 02:55:23
not know. 02:55:23
BY MR. ROSS: 02:55:25
Q. What is the relevance of the fact that this 02:55:25
was a Samsung-led meeting to the fact that you attended 02:55:27

this meeting? 02:55:32

MR. CUNNINGHAM: Vague and ambiguous. 02:55:32

MR. YOHAI: Objection, no foundation. 02:55:49

THE WITNESS: Relevance, I don't know. 02:55:58

BY MR. ROSS: 02:56:00

Q. Why did you bring up Samsung having led this 02:56:00

meeting this morning? 02:56:02

MR. YOHAI: Objection. 02:56:10

THE WITNESS: Because this meeting was held in 02:56:15

Samsung's Taiwan office. 02:56:19

BY MR. ROSS: 02:56:23

Q. And it is your testimony as you sit here that 02:56:23

while you remember certain specifics of the meeting, you 02:56:27

have no idea how you found yourself there? 02:56:28

A. I don't recall much details regarding this 02:57:08

meeting. All I remember was that Samsung had a lot of 02:57:10

disagreements with CPT at this meeting. 02:57:23

Q. So you have no recollection of how you ended 02:57:27

up at this meeting, is that -- 02:57:28

MR. YOHAI: Objection. Objection. I believe 02:57:34

he's answered this. Asked and answered three times. 02:57:36

You can answer again. 02:57:47

THE WITNESS: I was informed. 02:57:49

BY MR. ROSS: 02:58:02

Q. Did you speak with anybody at your company as 02:58:02

to whether or not once you were informed of the existence of the meeting, whether you should go to it or not? 02:58:04 02:58:06 02:58:10

A. I don't recall. 02:58:21

Q. Did you have authority to go meet with competitors on your own, or did you have to get approval from somebody at your company to do so? 02:58:23 02:58:23 02:58:27

A. Since I was informed, so I don't know if I had this authority or not. 02:59:06 02:59:13

Q. Generally, when you went to competitor meetings, did you go of your own accord, or did some -- did you get approval to attend them from somebody else at your company? 02:59:15 02:59:17 02:59:21 02:59:25

MR. YOHAI: Objection to the form of the question, to "generally". 02:59:25 02:59:27

THE WITNESS: I don't quite recall about having this particular policy. 03:00:00 03:00:02

BY MR. ROSS: 03:00:06

Q. And as you sit here today you can't even recall if the notification about the meeting came from somebody at your company or one of the -- your competitors, is that right? 03:00:06 03:00:08 03:00:12 03:00:13

MR. YOHAI: Objection, asked and answered. 03:00:30

THE WITNESS: I truly do not recall. It's been too long. I only remember some of the unique 03:00:38 03:00:42

images, for example, they were arguing, and they were arguing in English. 03:00:57 03:01:00

BY MR. ROSS: 03:01:02

Q. Do you generally recall Mr. Hsu, your boss, ever directing you to go meet with a competitor? 03:01:02 03:01:06

MR. YOHAI: Counsel, objection to the form of the question. I don't want to have a speaking objection, but you said do you generally recall, and then you said ever directing you. So I'm not sure which one of those you're -- 03:01:21 03:01:23 03:01:25 03:01:28 03:01:30

MR. ROSS: Yeah, I'm -- I'm trying to -- 03:01:32

MR. YOHAI: -- arguments -- 03:01:32

MR. ROSS: Find out if he's -- 03:01:34

MR. YOHAI: Are you asking does he -- if you say if he ever did, or generally did, yeah, it's two different questions. So maybe you could clean it up. 03:01:34 03:01:36 03:01:38

MR. ROSS: I will clean it up. 03:01:40

BY MR. ROSS: 03:01:42

Q. Do you recall Mr. Hsu ever directing you to meet with a competitor? 03:01:42 03:01:45

A. I don't quite recall. 03:02:02

Q. Turning to Exhibit 1857, sir, under Roman Numeral III, number one, in -- on the first page of the Chinese, do you see a table with production days for February, March and April for each of the makers listed 03:02:04 03:02:12 03:02:13 03:02:21

in that table, do you see that, sir? 03:02:25

A. Yes. 03:02:58

Q. And you would agree, given the date of this meeting of March 12th, 1997, that this table includes information for past production, current production and future production, February, March and April, right, sir? 03:03:00 03:03:02 03:03:06 03:03:08 03:03:15

MR. YOHAI: Objection. No foundation. 03:03:34

THE WITNESS: Would you please reask the question. 03:03:38 03:03:40

MR. ROSS: Can you read it back, sir. 03:03:42

- - - 03:04:27

(The court reporter read back as follows: 03:04:27 03:04:27

"QUESTION: And you would agree given the date of this meeting of March 12th, 1997, that this table includes information for past production, current production and future production, February, March and April, right, sir?") 03:04:27 03:04:27 03:04:27 03:04:27 03:04:27 03:04:27

- - - 03:03:57

MR. YOHAI: Same objection. 03:04:19

THE WITNESS: What are you asking? I still do not understand. 03:04:25 03:04:27

BY MR. ROSS: 03:04:27

Q. The table includes past production, current protection and future production information, does it not, sir? 03:04:27 03:04:30 03:04:32

A. Correct, by looking at the numbers from this table. 03:04:42 03:04:47

Q. And one of the makers included right at the bottom of the table is MEC. Correct, sir? 03:04:47 03:04:49

A. Yes. 03:05:02

Q. And do you recall that you were the source for the information regarding MEC? 03:05:02 03:05:04

A. Yes. I don't recall, because I only attended for a very short time, then I left. After Samsung and CPT had their arguments, I left. 03:05:15 03:05:21 03:05:30

Q. Right. We're not up to that, sir, at least in the chronology of these minutes. But if you recall, you recall, and if you don't you don't. 03:05:32 03:05:34 03:05:40

So let me continue. 03:05:42

Do you see the paragraph underneath the table? 03:05:43

A. Yes. 03:06:04

Q. And you see where it says MME -- well, right before where it says MMEC in English letters, there is a sentence that reads: Matsushita is not clear about BMCC's inventory, do you see that? 03:06:06 03:06:10 03:06:13 03:06:17

A. I see it. 03:06:38

Q. And does that refresh your recollection that 03:06:38

you were the one who was not clear about BMCC's inventory? 03:06:40 03:06:43

A. I don't recall. 03:06:58

Q. Turn to paragraph 3, sir. 03:06:58

A. Third paragraph. 03:07:04

Q. The heading is 14-inch Sales Price Review. Do you see that? 03:07:06 03:07:08

A. (No English translation provided.) 03:07:08

Q. In reading that paragraph, does that refresh your recollection that this was the argument that you testified to about earlier? 03:07:19 03:07:20 03:07:23

A. They did argue; however, they were speaking in English and it was very fast. I didn't quite understand it. 03:07:43 03:07:45 03:07:49

Q. But is this the argument that you're remembering, is this memorializing that argument, whether you understood it or not? 03:07:49 03:07:51 03:07:57

MR. YOHAI: Objection to the form of the question. You can answer if you know. 03:08:06 03:08:08

THE WITNESS: As I recall, this was their argument. 03:08:17 03:08:19

BY MR. ROSS: 03:08:21

Q. If you look at that paragraph towards the top it says on -- underneath the English, "Later on, SDD, LG, PH and CPT all indicated the bottom price of $67 for 03:08:21 03:08:23 03:08:28

MPRII's, it would be increased starting 4/1." 03:08:34

Do you see that? 03:08:40

A. Yes. 03:09:10

Q. Do you recall being there for that later agreement regarding bottom price? 03:09:12 03:09:13

MR. YOHAI: Objection to the form, you can answer. 03:09:28 03:09:30

THE WITNESS: I don't recall. 03:09:34

BY MR. ROSS: 03:09:40

Q. On the -- after this 14-inch price review, if you go to the next page, the top, there is a 15-inch Sales Price Review. 03:09:40 03:09:43 03:09:47

Do you recall whether you were there for that discussion? 03:09:47 03:09:49

A. I don't recall but I don't think I was present. 03:10:13 03:10:15

BY MR. ROSS: 03:10:17

Q. Do you see paragraph 5 which starts that: Each maker credited that a price increase would be inevitable. It is understood that there would be a top-level meeting in Korea on March 22nd. Everybody should get together again after the meeting to have more communications. 03:10:17 03:10:23 03:10:25 03:10:30 03:10:34 03:10:36

Do you see that, sir? 03:10:36

A. Yes. 03:11:06

Q. Do you recall whether you were there at the meeting for that discussion? 03:11:06 03:11:08

A. I don't recall. 03:11:19

Q. I have looked in these minutes, I do not see anywhere where it indicates that you left earlier than the other attendees. Do you see anything in the Chinese that I've missed? 03:11:21 03:11:23 03:11:25 03:11:28

A. No. 03:11:49

Q. Why do you think you left the meeting early? 03:11:51

A. More clear -- clearer recollection about that was because the attendees who were present there, they all had pretty high ranking, high titles. And Samsung was complaining that my title ranking was too low. 03:12:19 03:12:21 03:12:25 03:12:32

Q. Who at Samsung complained that your title ranking was too low? You can -- if it helps, there was -- the three Samsung attendees are listed at the top of the first page. 03:12:38 03:12:42 03:12:47 03:12:49

MR. CUNNINGHAM: Vague and ambiguous. 03:12:51

THE WITNESS: All I remember was that it -- he was Korean. 03:13:17 03:13:21

BY MR. ROSS: 03:13:23

Q. Have you taken a look at those three names and then none of them help? 03:13:25 03:13:27

A. Could be Ha, could be Lee. As far as I know, these two are Koreans. 03:13:38 03:13:45

Q. Do you recall if anybody superior to you, either Mr. Hsu or somebody else at your company, had planned to attend this meeting and then just couldn't make it for some reason? 03:13:47 03:13:49 03:13:51 03:13:57

A. I do not know about that. 03:14:13

Q. When -- how -- how did you leave? Did you just stand up and silently walk out of the room in the middle of a discussion? Did you say something to the other attendees? Tell us how you left the meeting. 03:14:17 03:14:19 03:14:23 03:14:27

A. All I remember was that I left after Samsung and CPT had their argument. There was a intermission or break time, that's when I left. 03:15:02 03:15:04 03:15:10

Q. Did you tell any of the other attendees that you were going to leave, or why you were going to leave? 03:15:13 03:15:15

A. I did tell them that I was leaving, but they did not have any reaction to that. 03:15:27 03:15:30

Q. And is the only reason that you left the fact that a Samsung person questioned whether you were of high enough rank to attend this meeting approximate? 03:15:36 03:15:38 03:15:40

MR. CUNNINGHAM: Objection. 03:16:02

THE WITNESS: Yes. 03:16:04

MR. YOHAI: Before you go on to another document, maybe just give him five minutes? 03:16:12 03:16:13

MR. ROSS: Did I get an answer? 03:16:17

MR. YOHAI: He said yes -- he said yes. 03:16:19

MR. ROSS: Do you need a break? 03:16:21

THE WITNESS: Yes, I'd like a break. 03:16:23

THE VIDEOGRAPHER: Going off the record. The time is 3:16. 03:16:25 03:16:26

(Recess taken.) 03:24:57

THE VIDEOGRAPHER: Back on the record. The time is 3:25. Please continue. 03:24:57 03:24:58

- - - 03:25:00

(Whereupon the document was marked, for identification purposes, as Exhibit 2603 and Exhibit 2603-E.) 03:25:00 03:25:00 03:25:00

- - - 11:15:21

BY MR. ROSS: 03:25:00

Q. Mr. Chang, we're back on the record after a break. Are you ready to continue? 03:25:00 03:25:03

A. Okay. 03:25:06

Q. Placed in front of you what has been marked as Exhibit 2603 and the translation 2603-E. It is Bates stamped CHU 00028497, and it's minutes of a meeting with Chunghwa and Matsushita Taiwan Taipei dated 9/12/97. 03:25:08 03:25:12 03:25:15 03:25:21

Do you see that, sir? 03:25:30

A. Yes, I see it. 03:26:10

Q. And have you had a chance to look it over to your satisfaction? 03:26:10 03:26:12

A. Please allow me a little bit more time to look 03:26:19

at it. 03:26:21

Q. Please do. 03:26:21

A. Okay. 03:27:13

Q. Sir, did you attend this meeting on September 12th, 1997? 03:27:13 03:27:15

A. I don't quite recall. I don't recall. 03:27:25

Q. Is your name listed there under the Matsushita customer contacts? 03:27:25 03:27:30

A. Yes. 03:27:40

Q. Is that Mr. Hsu's name next to yours? 03:27:40

A. Yes. 03:27:43

Q. I would note that the translation translates it differently than it has been in other -- this is just for the record, sir -- than in other documents, but that the witness was reading the Chinese when I asked that question. 03:27:47 03:27:49 03:27:57 03:27:58 03:28:02

A. Yes. 03:28:13

Q. Sir, if you would then focus on the first number that is numbered one in both the Chinese and in the translation that is labeled CRT prices. 03:28:19 03:28:23 03:28:25

Do you see the second -- third sentence, where it says: MEC believes that the 15-inch CDT market place has fallen below USD 85, and indicates that because currently there is not much quality difference, it does not plan to keep the price differential that it should 03:28:45 03:28:47 03:28:51 03:28:58 03:29:04

have with Taiwan/Korea. 03:29:06

Do you see that, sir? 03:29:06

A. I see it. 03:29:58

Q. And do you recall discussing the question of price differentials that Japanese makers like MEC were supposed to have with Taiwan and Korea makers? 03:30:00 03:30:04 03:30:12

A. I don't recall. 03:30:36

Q. Do you recall ever discussing those type of price differentials with competitors, or you -- as opposed to this -- in this particular meeting? 03:30:36 03:30:38 03:30:42

A. I don't quite recall. 03:31:06

Q. Okay. Sir, you can put that document aside. 03:31:08

I'm going to be handing two exhibits to you next, and if you could keep both in front of you as we discuss. The first which will be marked as Exhibit 2604 is Bates stamped CHU 00028495. It is minutes of a 10/31/97, bilateral meeting with Chunghwa. And as usual I'm handing you both the 2604 and its translation 2604-E. 03:31:15 03:31:17 03:31:25 03:31:30 03:31:36 03:31:43 03:31:47

MS. ZAHID: Oh, here, no that's -- 03:31:49

- - - 03:32:04

(Whereupon the document was marked, for identification purposes, as Exhibit 2604 and Exhibit 2604-E.) 03:32:04 03:32:04 03:32:04

- - - 03:31:57

BY MR. ROSS: 03:31:58

Q. And then I also am going to hand you 03:31:58

Exhibit 12 -- what's been previously marked as Exhibit 03:32:02

1237, which is minutes of a glass meeting -- 267 -- 03:32:06

12 -- 1237 and 1237-E, excuse me, which is minutes of a 03:32:13

glass meeting that occurred four days before 03:32:17

Exhibit 2604, the bilateral meeting. And we'll be 03:32:25

concentrating on the bilateral meeting first and then I 03:32:28

want to compare it with the glass meeting. 03:32:32

And if it helps, we're going to focus on the 03:33:42

other document first, the bilateral meeting and then the 03:33:43

second one, but I wanted you to have them both in front 03:33:57

of you so when you're finished reviewing the first one, 03:33:58

let us know and we'll talk. 03:34:02

A. I finished reading Exhibit 2604. 03:35:40

Q. Okay. Let's start there. If you look at the 03:35:43

customer names on 10/13/97, this meeting, is that 03:35:45

Mr. Hsu and yourself and a third person listed as 03:35:57

attending for your company? 03:36:02

A. Yes. 03:36:21

Q. There is a third person listed, a Bo-Cang Lee 03:36:23

after the words "LCD". Do you know who Mr. Lee is? 03:36:30

A. Yes, I do. 03:36:40

Q. And what was his position at this time at your 03:36:40

company? 03:36:45

A. I believe he had this same level of position like I did. 03:36:57 03:37:00

Q. Okay. But was he in a different section responsible for LCDs? 03:37:02 03:37:04

A. Yes, it's a different section, different department. 03:37:13 03:37:17

Q. Okay. Do you see under number one in the original, it talks about MEC's overseas factories status in the first section? 03:37:23 03:37:23 03:37:27

A. I see it. 03:37:34

Q. And the type of information that you are providing to your competitor, Chunghwa, regarding production is similar to the type of information we've already seen in some of the other minutes, right, sir? 03:37:34 03:37:36 03:37:40 03:37:42

MR. YOHAI: Objection -- objection to the form. 03:38:04 03:38:04

THE WITNESS: I don't recall. 03:38:10

BY MR. ROSS: 03:38:10

Q. All right. And if you look at number 2, number 2, talks about MEC's 1997 third quarter Taiwan maker delivery status and then in handwriting is sort of a table of customers and size CRTs, do you see that? 03:38:10 03:38:12 03:38:17 03:38:21

A. I see it. 03:38:51

Q. Was Acer, the first line, was Acer a customer of your company, sir? 03:38:57 03:39:00

A. Yes, same as what I had mentioned this morning, which was API. 03:39:12 03:39:15

Q. So Acer was API? 03:39:17

A. Yes. 03:39:19

Q. Okay. And what about the last line, Compal, is that also a customer of yours? 03:39:21 03:39:25

A. Yes. It's also our customer. 03:39:32

Q. Okay. If you could turn to paragraph 3 which is on the second page of the original in Chinese and in English it says the heading CT -- CDT Price. 03:39:36 03:39:38 03:39:45

A. I see it. 03:40:08

Q. And do you see here in Chunghwa minutes start out that MEC claimed that currently its supply prices are -- and then it gives prices for 14-, 15- and 17-inch. Do you see that, sir? 03:40:08 03:40:10 03:40:13 03:40:17

A. Yes, I see it. 03:40:42

Q. And then it says CPT, Chunghwa, indicated that currently the main 14-inch suppliers, CPT/SDD/PH, already have a common understanding not to keep competing viciously, guard the bottom line of US dollar 58, please pass on to BMCC for coordination. 03:40:42 03:40:45 03:40:51 03:40:57 03:41:00

Do you see that, sir? 03:41:06

MR. YOHAI: Objection to the extent that counsel is just reading a lot of portions of the document and just asking the witness if he sees it. 03:41:10 03:41:10 03:41:13

THE WITNESS: Yes, I see it. 03:42:04

BY MR. ROSS: 03:42:04

Q. Does that refresh your recollection, sir, that at this meeting, Chunghwa indicated to you that three of your competitors, Chunghwa, Samsung Displays, and Philips had achieved a common understanding not to compete viciously and to guard a bottom line price of $58 US? 03:42:04 03:42:06 03:42:08 03:42:12 03:42:15 03:42:19

A. I don't recall. 03:42:47

Q. And do you recall further that they then asked you to pass on to BMCC Beijing MEC for coordination, do you recall that, sir? 03:42:47 03:42:49 03:43:00

A. I don't recall. 03:43:17

Q. Let me see if I can refresh your recollection. If you can take a look at Exhibit 1237, now that's the second one, the one above right there, which is Meeting Minutes of a Glass Meeting conducted four days before on October 9th, 1997. I want -- regard -- with Samsung Display, Philips and Chunghwa. 03:43:17 03:43:19 03:43:23 03:43:27 03:43:32 03:43:40

I want to direct your attention first to the attendees for Chunghwa, and do you see that Mr. Michael Du is one of the attendees for Chunghwa? 03:43:43 03:43:49 03:44:00

MR. YOHAI: Objection to the extent counsel is testifying and to no foundation with this witness. 03:44:04 03:44:04

THE WITNESS: I do see the name of Michael Du 03:45:10

here. 03:45:12

BY MR. ROSS: 03:45:12

Q. And do you see looking back at Exhibit 2604 that Mr. Du also attended the bilateral meeting with yourself? 03:45:12 03:45:15 03:45:19

MR. YOHAI: Same objection. 03:45:30

THE WITNESS: Yes, I see it. 03:45:36

BY MR. ROSS: 03:45:36

Q. Now, turning to paragraph 2 of the group meeting minutes, Exhibit 1237, do you see that there is generally a discussion of what pricing should be for 14-inch tubes? 03:45:36 03:45:42 03:45:51 03:45:58

MR. YOHAI: Objection to the form. Same objections as before. 03:46:12 03:46:15

THE WITNESS: Are you referring to this paragraph on page 2, or the paragraph on page 1? 03:46:19 03:46:19

BY MR. ROSS: 03:46:23

Q. I'm referring to in -- in the group meeting minutes, Exhibit 1237, paragraph 2 on the second page. After -- after B, after Market Condition Price Review. I see the problem, there are two 2s. 03:46:25 03:46:27 03:46:45 03:46:49

A. Yes. 03:46:51

Q. And can you confirm for me that that is a discussion of what the pricing for 14-inch tubes should be? 03:46:57 03:47:00 03:47:02

MR. YOHAI: Objection to the form. Objection to no foundation that the witness was at this meeting, objection. 03:47:10 03:47:13 03:47:17

THE WITNESS: Would you ask the question again? I don't understand what did you mean by asking regarding this paragraph. 03:47:27 03:47:27 03:47:32

BY MR. ROSS: 03:47:32

Q. Can you confirm for me that this paragraph is generally a discussion of what pricing should be for 14-inch tubes? 03:47:34 03:47:36 03:47:38

MR. YOHAI: Objection to the form. Objection to no foundation with the witness being at the meeting. 03:47:49 03:47:51

THE WITNESS: I do see that they had a discussion but I do not understand what is the meaning of the whole discussion mentioned here. 03:48:51 03:48:51 03:49:00

BY MR. ROSS: 03:49:02

Q. Let me direct you to a specific sentence. I believe it's on the third page of the Chinese original and says, "As for major customers such as Acer/Lite-on", those words in English, "please insist on guarding the prices, bottom price is currently at USD 58.00/pc." 03:49:02 03:49:04 03:49:08 03:49:13 03:49:17

Do you see that? 03:49:23

MR. YOHAI: Objection -- objection to the form. 03:49:51 03:49:57

MR. ROSS: It's about six lines down from the 03:49:57

top of the page. 03:49:58

MR. YOHAI: Objection. Objection to the 03:50:00

extent you're just asking the witness to read this 03:50:04

document. He wasn't at this meeting. I don't know what 03:50:06

you want him to do with this. 03:50:08

MR. ROSS: I have to get him where I need him 03:50:10

to be and then I'm going to ask him the question. 03:50:12

MR. YOHAI: No foundation. If document speaks 03:50:13

for itself. 03:50:19

THE WITNESS: What do you want me to recall? 03:50:19

I don't understand. 03:50:21

BY MR. ROSS: 03:50:23

Q. First I want to just get you to the right 03:50:23

sentence. Are you there, sir? 03:50:25

A. The handwriting is very messy, that's why I 03:51:02

cannot fully understand it. 03:51:06

Q. Can you find around six lines down the 03:51:10

sentence that says, "As for major customers such as 03:51:12

Acer/Lite-on, please insist on guarding the prices, 03:51:15

bottom price is currently at USD 58." 03:51:17

MR. YOHAI: Same objection. 03:51:36

BY MR. ROSS: 03:51:36

Q. Okay. Now, comparing that at the meeting four 03:51:38

days before the meeting you attended to paragraph 3 03:51:40

which we just looked at, can you confirm for me, and -- 03:51:42

well, strike that. 03:51:45

Does this refresh your recollection that 03:51:47

Chunghwa at the meeting you attended was telling you 03:51:51

that these suppliers had just reached an un- -- a common 03:52:00

understanding regarding the bottom line price of $58 03:52:04

for -- for 14-inch tubes? 03:52:06

MR. YOHAI: Same objection. 03:52:40

THE WITNESS: I don't recall because this 03:52:47

document does not help me to refresh my merry -- my 03:52:47

memory because these two are different things. 03:52:57

BY MR. ROSS: 03:52:58

Q. Do you generally recall, sir, that at your 03:52:58

one-on-one meetings with Chunghwa from time to time they 03:53:00

would tell you about the results of their meetings with 03:53:04

other competitors? 03:53:08

A. I don't recall. 03:53:36

Q. Do you generally recall, like in paragraph 3 03:53:36

of Exhibit 2604, that Chunghwa would ask you to follow 03:53:38

that common understanding that had been reached in the 03:53:43

glass meetings? 03:53:47

MR. YOHAI: Objection to the term "glass 03:53:49

meetings". 03:53:51

THE WITNESS: I don't recall, neither do I 03:54:19

know about glass meeting, what does it mean by glass 03:54:23

meeting. 03:54:28

BY MR. ROSS: 03:54:28

Q. If I changed the question to a group meeting, 03:54:28

do you generally recall that from time to time in your 03:54:32

meetings with Chunghwa they would ask you to follow the 03:54:34

agreements reached on pricing at group meetings with 03:54:38

your other competitors? 03:54:42

MR. YOHAI: Same objection. 03:54:45

BY MR. ROSS: 03:54:45

Q. Do you recall that? 03:54:45

MR. YOHAI: Same objection. 03:54:47

THE WITNESS: Yes. 03:55:25

MR. ROSS: Okay. You can put both of those 03:55:27

away. 03:55:28

MR. YOHAI: Thank you. 03:55:34

BY MR. ROSS: 03:55:34

Q. While you're looking at it, sir, for the 03:55:34

record, the next exhibit has been previously marked as 03:55:36

Exhibit 1128. It's Bates stamped CHU 00028490 and it is 03:55:40

minutes of a November 7th, 1997, meeting between 03:55:47

Taipei Matsushita and Chunghwa. 03:55:57

Sir, if you'd take a moment to review as much 03:56:25

of that document, the original, as you would like, and 03:56:28

then I have some questions for you. 03:56:30

A. Okay. 03:59:51

Q. If you look at the top on the second line of 03:59:51

Exhibit 1128, do you see that you and Mr. Hsu are listed as attending for Taipei Matsushita? 03:59:58 04:00:06

A. I see it. 04:00:23

Q. And do you see on the fourth line that the contents of this report are described as CDT price negotiation? 04:00:23 04:00:25 04:00:30

A. Referring to B. 04:00:57

Q. Well, at the fourth line it just says CDT price negotiation; correct? 04:01:00 04:01:04

A. Not a negotiation, but a discussion. 04:01:15

Q. Is that your -- is that your translation of the word, you would translate it differently than what I said? 04:01:17 04:01:21 04:01:23

A. Because of the interpreter's interpretation of "negotiation" which is different than what it says here. 04:01:34 04:01:38

Q. Hold on. 04:01:42

A. Because you said it's negotiation and it's different than "discussion". 04:01:42 04:01:45

Q. Oh. Let me make sure I understand your testimony. Reading the Chinese, the fourth line, please tell us how you would -- what that -- how you would translate that line. 04:01:47 04:01:49 04:01:57 04:02:00

A. I think if you use the word "discussion", it would be closer to the meaning. 04:02:25 04:02:27

Q. Okay. 04:02:28

A. It's closer. 04:02:28

Q. If you then turn to B, which I think you had started to, it says the same thing; correct? 04:02:36 04:02:38

A. I believe so. 04:02:57

Q. And -- 04:03:00

A. It's kind of messy in the handwriting. 04:03:00

Q. Okay. It's that section that I want to focus on. And if you would, turn to page to the second page of the original, and do you see about two-thirds of the way down, do you see sort of a mini table which has B&D Tube off to the left and 14- and 15-inch at the top and shows some price differentials. 04:03:04 04:03:06 04:03:08 04:03:15 04:03:21 04:03:25

Do you see where I'm talking about? 04:03:27

A. Yes, I see that. 04:03:57

Q. And do you see that right before that mini-table, it says that Chunghwa is explaining the current practice with regard to price differentials of various CDT tubes? 04:03:58 04:04:00 04:04:02 04:04:06

A. Yes, I see it. 04:04:28

Q. Let me ask you sort of separate from the document for a second, was it the general practice of MEC to instruct you guys with regard to pricing that there should be sort of a constant differential between pricing of different sized tubes? 04:04:28 04:04:30 04:04:32 04:04:34 04:04:38

MR. CUNNINGHAM: Object to form. 04:05:13

THE WITNESS: I'm not very clear about the question. Would you please rephrase the question? 04:05:23 04:05:25

BY MR. ROSS: 04:05:27

Q. Sure. Was there a general policy in terms of pricing your CRT products, to maintain a specific differential between the si- -- the price for different sizes of CRTs, for example, that 15-inch CRTs would always be X number of dollars greater than 14-inch CRTs, 17-inch CRTs would be X number of dollars greater than the 15-inch; 21-inch CRTs would be some X or Y number of dollars greater than the 15-inch, and so on? 04:05:27 04:05:30 04:05:36 04:05:40 04:05:45 04:05:49 04:05:51 04:06:00

A. I don't recall having this set of price differentials. It depends on the market size demanded. There is not a set of price differential such as between 14 to 15, and 15 to 17, and so forth. 04:07:13 04:07:13 04:07:21 04:07:27

Q. Okay. In this case, in this -- in these minutes, Chunghwa is explaining their current practice that they have with their competitors was to set these price differentials and it says asked MEC to please cooperate and support. 04:07:30 04:07:34 04:07:38 04:07:42 04:07:47

Do you recall that happening, that they asked for these differentials between 14- and 15-inch that they set forth here in the memo, they asked MEC to please cooperate and support those differentials? 04:07:49 04:07:51 04:08:00 04:08:04

MR. YOHAI: Objection to the extent counsel is 04:08:08

testifying. Objection to the form. You can answer. 04:08:10

THE WITNESS: I don't recall. 04:09:08

BY MR. ROSS: 04:09:08

Q. The minutes go on to note that your boss, 04:09:10

Mr. Hsu, made some claims regarding 14 and 15 inches, 04:09:12

and then says if there was a chance to reduce the loss 04:09:15

MEC would gladly FLW, in English letters. 04:09:21

Do you recall Mr. Hsu making those comments? 04:09:27

A. I don't recall. I don't recall about that. 04:10:06

Q. Do you generally recall at meetings with your 04:10:06

competitor, Chunghwa, that from time to time Matsushita 04:10:10

would agree to follow agreements that Chunghwa hold told 04:10:13

you had been made with other competitors in the CRT 04:10:19

business? 04:10:23

MR. YOHAI: Objection to the form. 04:10:23

THE WITNESS: I don't recall having done so 04:11:04

because we did not have the authority to pricing. 04:11:06

BY MR. ROSS: 04:11:10

Q. Can you explain then, sir, in the documents 04:11:12

that we've seen so far the indications that Chunghwa 04:11:15

puts down where it indicates that Matsushita has agreed 04:11:19

to follow certain pricing, or agreed on bottom prices? 04:11:25

MR. YOHAI: Objection, counsel's testimony, 04:11:28

objection, argumentative. 04:11:30

THE WITNESS: I don't see it on this document 04:12:06

that we have agreed. 04:12:08

BY MR. ROSS: 04:12:12

Q. Sir, do you see that -- the sentence, "So if 04:12:12

there was a chance to reduce the loss, MEC would gladly 04:12:15

FLW", follow? 04:12:17

A. What I read, this is a hypothetical tone. 04:12:42

This is a hap- -- hypothetical way of describing. It 04:12:57

says "if there is a chance". 04:13:02

Q. Do you recall if, in fact, that hypothetical 04:13:08

occurred and you -- MEC gladly followed the price 04:13:10

differentials that Chunghwa put forth in this document? 04:13:15

A. I don't recall. 04:13:40

MR. ROSS: Sir, I think we're in agreement 04:13:40

that we'll stop for the day and come back tomorrow. 04:13:42

THE WITNESS: All right. 04:13:45

THE VIDEOGRAPHER: This concludes today's 04:13:45

deposition of Yu-Hao Zhang, a/k/a Allen Chang. The time 04:13:45

is 4:14 p.m. We're off the record. 04:13:51

(Whereupon, the deposition was

adjourned at 4:14 p.m.)

--oOo--

I, YU-HAO ZHANG, declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on _____, 2014, at _____, _____.

_____

YU-HAO ZHANG

CERTIFICATE OF REPORTER

I, KENNETH T. BRILL, a Certified Shorthand Reporter, hereby certify that the witness in the foregoing deposition was by me duly sworn to tell the truth, the whole truth, and nothing but the truth in the within-entitled cause;

That said deposition was taken down in shorthand by me, a disinterested person, at the time and place therein stated, and that the testimony of the said witness was thereafter reduced to typewriting, by computer, under my direction and supervision;

I further certify that I am not of counsel or attorney for either or any of the parties to the said deposition, nor in any way interested in the event of this cause, and that I am not related to any of the parties hereto.

Dated: March 25, 2014.

KENNETH T. BRILL

CSR#12797

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EXHIBIT 15

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

IN RE: CATHODE RAY TUBE (CRT) ANTITRUST LITIGATION

This Document Relates to: ...(continuing caption page 2)

No. 07-cv-05944SC
MDL No. 1917

SUPERIOR COURT OF THE STATE OF CALIFORNIA
CITY AND COUNTY OF SAN FRANCISCO

STATE OF CALIFORNIA, et al.,
Plaintiffs,
v.
SAMSUNG SDI, INC., CO., LTD, et al.,
Defendants.

No. CGC-11-515784

HIGHLY CONFIDENTIAL

DEPOSITION OF HITACHI DISPLAYS, LTD.

TORU IWASAWA

San Francisco, California

Wednesday, July 11, 2012

Volume I

Reported by:
ASHLEY SOEVYN
CSR No. 12019

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

IN RE: CATHODE RAY TUBE (CRT) ANTITRUST LITIGATION	
This Document Relates to: Direct Purchaser Plaintiff Class Actions;	No. 07-cv-05944SC MDL No. 1917
Indirect Purchaser Plaintiff Class Actions; State of Florida, Office of the Attorney General, Department of Legal Affairs v. LG Electronics, Inc., et al., No. 2011-CV-6205 SC	

SUPERIOR COURT OF THE STATE OF CALIFORNIA
CITY AND COUNTY OF SAN FRANCISCO

STATE OF CALIFORNIA, et al., Plaintiffs, v. SAMSUNG SDI, INC., CO., LTD, et al., Defendants.	No. CGC-11-515784

Highly confidential deposition of Hitachi, Ltd. through Toru Iwasawa, Volume I, taken on behalf of Indirect Purchaser Plaintiffs, at One Market Street, Spear Street Tower, 28th Floor, San Francisco, California, commencing at 9:15 a.m. and ending at 11:19 a.m., Wednesday, July 11, 2012, before Ashley Soevyn, CSR 12019.

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Oliver Hennigan, Consultant

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WITNESS	EXAMINATION
TORU IWASAWA	
By MS. ANDERSON	8

EXHIBITS

NUMBER	DESCRIPTION	PAGES
Exhibit 226	Amended Notice of Deposition Pursuant to Rule 30(b)(6)	12

Wednesday, July 11, 2012; San Francisco, California 08:11:59

9:13 a.m. 08:11:59

---OOO--- 08:11:59

Sadaaki Matsutani, 08:11:59

the interpreter, having been administerd an oath by the Court Reporter, interpreted from English to Japanese and from Japanese to English, as follows: 08:11:59

08:11:59

Toru Iwasawa, 08:11:59

the witness, having been administered an oath by the Court Reporter, testified as follows: 08:11:59

08:11:59

EXAMINATION 08:11:59

BY MS. ANDERSON: 08:12:01

Q. Could you begin by stating your full name for the record? 09:13:10

A. Yes, my name is Toru Iwasawa. 09:13:13

Q. My name is Jennie Anderson. I represent the indirect purchaser plaintiffs in the case. I'll be asking you a number of questions today. First, a matter of housekeeping, the plaintiffs are reserving portions of their allotted time for future topics. To the degree there are exhibits that are native format exhibits, those have been modified per the ESI order to contain confidential designations and 09:13:14 09:13:23 09:13:25 09:13:30 09:13:33 09:13:39 09:13:42 09:13:47 09:13:50

Bates numbers for printing purposes only. 09:13:55

Have you had your deposition taken 09:14:33

before? 09:14:34

A. No. 09:14:38

Q. I'm going to go through some of the ground 09:14:39

rules for taking a deposition. Your attorney may 09:14:41

have gone through them before, but these are just as 09:14:44

a reminder. First, you do understand that the oath 09:14:46

you just took is the same oath you would take to -- 09:14:49

if you were testifying in a court law? 09:14:53

A. Yes. 09:15:20

Q. Throughout the course of the day, your 09:15:22

attorney may make objections. Unless she instructs 09:15:25

you specifically not to answer, I'm still entitled 09:15:27

to a response after those objections are placed on 09:15:30

the record. Do you understand that? 09:15:32

A. Yes. 09:15:59

Q. Today the court reporter is going to be 09:16:01

taking down everything that we say, so it's 09:16:04

important that all of your responses be verbal. She 09:16:06

can't interpret nods or shakes of the head. Do you 09:16:09

understand that? 09:16:14

A. Yes. 09:16:32

Q. And is there any reason why you are unable 09:16:34

to give full and accurate testimony today? 09:16:41

A. No. 09:16:47

Q. Are you taking any kind of medication or 09:16:48

suffer from any medical condition that would prevent 09:16:51

you from giving full and complete testimony today? 09:16:54

A. No. 09:17:06

Q. I'll try to be as clear as possible. If at 09:17:08

any time you don't understand my question, please 09:17:11

let me know and I'll try to rephrase it. If you 09:17:14

answer my question, though, I will assume that you 09:17:16

understood the question; is that fair? 09:17:19

A. That's fine. 09:17:48

Q. And today I'm entitled to your best 09:17:49

testimony. So while I'm not asking you to guess, I 09:17:51

am entitled to your best estimates to the degree you 09:17:54

are able to give such estimates. Do you understand 09:18:00

that? 09:18:05

A. Yes. 09:18:27

Q. And we'll be taking breaks throughout the 09:18:29

course of the day. If you feel that you need a 09:18:30

break at any time, just let me know. I only ask if 09:18:33

there is a question pending, that the question be 09:18:36

answered and then we can go off and take a break. 09:18:39

Is that okay? 09:18:42

A. That's fine. 09:19:01

Q. Okay. For the purposes of this deposition, 09:19:02

1	the time period that we'll be talking about will be	09:19:05
2	1995 to 2005 unless I specify otherwise. Does that	09:19:10
3	sound okay?	09:19:16
4	A. Yes.	09:19:29
5	Q. I'm going to spend just a few minutes	09:19:31
6	getting some very general background information	09:19:36
7	from you. Could you describe your employment	09:19:39
8	history at Hitachi Limited?	09:19:41
9	A. Yes. I joined stat sales Corporation in	09:19:56
10	1984. In 1995, stat sales Corporation merged with	09:20:35
11	Hitachi Limited, so I became an employee of statute	09:20:40
12	limited. Currently, I work for statute consumer	09:20:47
13	electronics, which is 100 percent subsidiary of	09:20:52
14	Hitachi Limited that's spun off in 19-" --	09:20:55
15	Interpreter correction, "2009."	09:21:01
16	Q. And during your time at Hitachi Limited in	09:21:05
17	the 1995 to 2005 time period, what were your	09:21:11
18	duties?	09:21:17
19	A. I was with the sales department of	09:21:39
20	televisions for Japanese market, more specifically	09:21:48
21	at the product planning department.	09:21:57
22	Q. And what did product planning department	09:21:59
23	do?	09:22:01
24	A. At the product planning department I was	09:22:31
25	with for the Japanese domestic sales, the major	09:22:34

responsibilities included making plans for new products, look at the market trends, make projections for the products, and along with marketing and engineering design people, prepare proposals for pricing. 09:22:41 09:22:46 09:22:52 09:22:59 09:23:05

Q. And did any of your duties involve sales for products in the United States? 09:23:08 09:23:14

A. No. 09:23:23

Q. And as part of your duties at Hitachi Limited, were you familiar with the CRT television manufacturing process? 09:23:25 09:23:35 09:23:40

A. Not in detail. 09:23:53

Q. And are you familiar with the various components that are used to manufacture CRT televisions? 09:23:58 09:24:03 09:24:12

A. Not in detail. 09:24:19

Q. And is it your understanding that you are here today to testify on behalf of Hitachi Limited? 09:24:32 09:24:34 09:24:39

A. Yes. 09:24:48

MS. ANDERSON: I'm going to ask the court reporter to mark as Exhibit 226 the "Amended Notice of Deposition Pursuant to Rule 30 (b)(6)." 09:24:51 09:24:52 09:24:57

(Exhibit 226 marked for identification.) 09:25:51

BY MS. ANDERSON: 09:25:51

Q. Have you seen this document before? 09:25:51
A. Yes. 09:25:56
Q. Okay. And is it your understanding that you are here to testify about certain topics in this notice? 09:25:57 09:25:58 09:26:01
A. Yes. 09:26:10
Q. Okay. Could you please turn to page 5 of the notice that is entitled Exhibit A? The next few pages are a list of various topics. Could you please identify which of these topics you are designated to testify on behalf of Hitachi Limited regarding? 09:26:11 09:26:18 09:26:35 09:26:39 09:26:45 09:27:12
A. Since I don't understand the English, I cannot tell you as I sit here today which topics they are. 09:27:14 09:27:18 09:27:21
Q. Okay. Well, we can go through the ones I understand from your counsel that you are being designated on. I will just confirm that you are prepared to testify about those issues. Okay? 09:27:22 09:27:24 09:27:27 09:27:30
A. Fine. 09:27:45
Q. Okay, the -- Topic No. 1 is your "corporate structure during the relevant period, including the identification of departments within various Hitachi defendants and their functions, policies, and systems. The identification of any individuals that 09:27:46 09:27:51 09:27:51 09:27:55 09:27:57

had managerial responsibility for manufacture, purchase, sales, marketing, pricing, or distribution of CRT or CRT-finished products and any ownership, managerial overlap, if any, among the Hitachi defendants and their affiliates." 09:28:00 09:28:04 09:28:05 09:28:11 09:28:14

MR. ROGER: As a heads up, I now understand that it's Mr. Morishima testifying tomorrow who will be able to testify to the topics 1 through 5 relating to corporate structure and operation. So you're welcome to ask him, I just want to let you know that that's what -- 09:28:48 09:28:51 09:28:55 09:29:00 09:29:03 09:29:08

MS. ANDERSON: Can we go off the record for a second? 09:29:08 09:29:10

THE REPORTER: Sure. 09:30:26

(Off-the-record discussion.) 09:30:26

MR. ROGER: So I actually want to clarify something that I said about topics 1 through 5. Mr. Morishima will be testifying about the corporate structure of the various Hitachi defendants tomorrow to the extent that's included in No. 1. 09:33:14 09:33:17 09:33:21 09:33:25 09:33:29

To the extent we're talking about topic No. 2, he'll be in a position to talk about televisions in Japan. Likewise, 3: televisions in Japan, 4: televisions in Japan, and 5: televisions in Japan. I don't want to overstep my bounds in terms of the 09:33:32 09:33:35 09:33:41 09:33:47 09:33:57

sales of televisions in US. If you want me to state something about what I know, that's fine. If you just want to ask him, that's fine, too. 09:34:01 09:34:05 09:34:06

MS. ANDERSON: Well, we can just -- thank you for the clarification on topics 1 through 5 And then if you -- on page 8 of the notice, it's my understanding that the witness will be testifying about Nos. 19 through 23. 09:34:09 09:34:11 09:34:15 09:34:26 09:34:29

Interpreter, if you could go through those with him and starting with 19. 09:34:36 09:34:39

MR. ROGER: While she's doing that so he's not understanding what I'm saying, again, that's going to be limited to televisions in Japan. Again, there is no Hitachi televisions sold in the United States. 09:34:52 09:34:53 09:34:57 09:35:00 09:37:44

THE INTERPRETER: 19 through 20? 09:37:45

MS. ANDERSON: Through 23. 09:37:49

Q. Is it your understanding that you're here to testify about the categories that you just reviewed? 09:38:15 09:38:17 09:38:19

A. Yes. 09:38:28

Q. And then on the following page, No. 25, "your knowledge, use, and tracking of retail prices or street prices for CRT finished products," is it your understanding that you're here to testify on 09:38:29 09:38:33 09:38:36 09:38:52

behalf of Hitachi Limited with respect to No. 25? 09:38:54

A. Yes. 09:39:04

Q. And finally No. 32, "Your sale of CRT products in or into the United States and the methods by which CRT products are exported to the United States"? 09:39:05 09:39:11 09:39:13 09:39:16

A. Yes. 09:39:28

Q. Are you prepared to testify and behalf of Hitachi Limited with respect to that category? 09:39:29 09:39:34

A. Yes. 09:39:37

MS. ANDERSON: And then, Counsel, Ken, you had made a proffer with respect to the narrowing of those topics for which he's been presented. If you could just state that again and whether that applies to all of the topics that we just reviewed? 09:39:37 09:39:44 09:39:49 09:39:57 09:39:58

MR. ROGER: Yeah, and again, yes, I guess more precisely than that I was stating the narrowing of the topics -- the topic as they're stated assume a fact, for example, that there was Hitachi Limited sales of CRT products to wit, televisions into the United States during the period that you set out is relevant to this deposition. And that is not the case. 09:40:02 09:40:03 09:40:05 09:40:11 09:40:16 09:40:20 09:40:24 09:40:26

So he will be testifying about televisions sold by Hitachi, but there were no televisions sold 09:40:27 09:40:29

by Hitachi in the United States during the period. 09:40:34
MS. ANDERSON: Can we go off the record? 09:40:45
THE REPORTER: Sure. 09:52:47
(Recess taken.) 09:52:47
BY MS. ANDERSON: 09:52:47
Q. Okay. Just to make sure that our 09:52:47
terminology is consistent, for the purposes of 09:52:52
today's deposition when I refer to a CRT TV or a TV, 09:52:55
I'm referencing a direct view CRT-based television 09:53:01
as distinct from a flat panel or projection CRT TV. 09:53:09
Do you understand that? 09:53:19
A. I'm not quite sure what you mean when you 09:53:46
say "direct view." 09:53:48
MR. ROGER: Okay, one matter of 09:53:50
clarification, I believe Jennie said as 09:53:51
distinguished from flat panel or PRT TV. Did you 09:53:52
say PRT? 09:53:52
MS. ANDERSON: Projection. 09:54:01
MR. ROGER: Right. I just noted the record 09:54:05
has CRT, I just want to make -- (Cross-talking.) 09:54:05
THE REPORTER: Okay. 09:54:09
MS. ANDERSON: Yeah, right, a projection 09:54:09
CRT television is what I said. 09:54:09
MR. ROGER: Projection, right? 09:54:12
MS. ANDERSON: Yeah. 09:54:16

BY MS. ANDERSON: 09:54:16

Q. Okay. So what is your understanding of the 09:54:16
term "CRT televisions"? 09:54:21

A. That's cathode ray tube televisions. 09:54:31

Q. Okay. So today, when I refer to -- when 09:54:38
we're talking about televisions or CRT TVs, I'm 09:54:42
talking about televisions that are equipped with 09:54:45
CRTs, and in this case, CPT, and I will be excluding 09:54:49
any reference to flat panels, such as LCD or PDPs, 09:54:55
and I will also be excluding any projection 09:55:03
televisions, even though they may use another type 09:55:07
of CRT; is that fair? 09:55:11

A. Yes. 09:55:48

Q. Okay. During the time period we're 09:55:50
discussing today, did Hitachi Limited manufacture 09:55:55
CRT televisions? 09:55:59

A. Yes, between 1995 and 2002, Hitachi Limited 09:56:37
had business in Japan of selling such televisions, 09:56:47
and therefore, such TVs were manufactured for Japan. 09:56:50
In the United States, at least from 1995, which I 09:56:56
was able to confirm, there was no business of 09:57:03
selling televisions -- CRT televisions in United 09:57:08
States -- excuse me, let me correct my statement. 09:57:13

The period when Hitachi was doing TV 09:57:24
business in Japan was from 1995 to 2000, not 2002. 09:57:28

Q. Okay. And first, with respect to the manufacture of the CRT televisions, were those televisions being manufactured for sale in a particular geographic location? 09:57:37 09:57:42 09:57:47 09:57:52

A. Well, since I was in charge of the sales in Japan, those are the TV models that were sold only in Japan. 09:58:19 09:58:23 09:58:28

Q. So was Hitachi Limited during the relevant time period manufacturing televisions for sale outside of Japan? 09:58:31 09:58:37 09:58:40

A. When I looked into the records, I did see that from 1995 to -- interpreter correction -- from 1995 to March 1996, I saw the records of shipment to Europe and Asia regions, but not to the States. 09:59:11 09:59:17 09:59:23 09:59:33

Q. And does the geographic location of the end consumer of a CRT television matter for the television manufacturing process? 09:59:51 09:59:59 10:00:05

A. I would say perhaps it does. 10:00:28

Q. In what ways? 10:00:30

A. That is because in terms of cost, there are more advances to manufacture closest or closer to the final -- to where the final consumers are. 10:00:45 10:00:51 10:00:56

Q. And for the Hitachi televisions that were being -- that you referred to from 1995 to 1996 that were shipped to Europe and Asia, do you know whether 10:01:06 10:01:12 10:01:18

those were intended for sale to Europe and Asia? 10:01:23
And by that I mean sale to the end consumer? 10:01:42
A. Where -- since I was involved with the 10:01:56
sales in Japan, I may not know exactly, but that's 10:01:58
what I think. 10:02:01
Q. Okay. Did you talk to anybody else at 10:02:05
Hitachi Limited to find out whether who the intended 10:02:10
end-users were for the televisions Hitachi Limited 10:02:14
sold? 10:02:20
A. No. 10:02:36
Q. And do you know from a technical standpoint 10:02:44
whether a television manufactured for use in Europe 10:02:48
or Asia can be used in the United States? 10:02:52
A. Although I do not know exactly, generally 10:03:49
speaking, the broadcasting systems are different in 10:03:53
the United States and in Europe. In Asia, except 10:03:57
Korea, the broadcasting system is also different 10:04:03
from that in the United States. The voltages are 10:04:06
different and the pressure for the tuners are also 10:04:11
different. And therefore, I would say it is not 10:04:15
possible to use television sets in the continental 10:04:23
United States that are manufactured for Europe and 10:04:27
Asia except Korea. 10:04:31
Q. And so are -- why do you say "except 10:04:37
Korea"? Explain that. 10:04:43

A. That is because the United States, Japan, and Korea share the same broadcasting system referred to as NTSC. 10:04:56 10:05:01 10:05:04

Q. So could a television manufacturer for use in Japan be used in the United States? 10:05:12 10:05:15

A. Although both countries share the same broadcasting system, the frequency ranges are different and the voltage is different. Consequently, although I have never tried, and therefore I cannot say for sure, I would say it's not possible to use such televisions in the States. 10:05:40 10:05:42 10:05:47 10:05:52 10:05:55 10:05:59 10:06:03

Q. And to the degree of television was manufactured for use in a non-U.S. area, could it be adapted in some way for sale in the United States? 10:06:03 10:06:06 10:06:11

A. I would not know. 10:06:29

Q. And who at Hitachi Limited would know the answer to that kind of technical question? 10:06:39 10:06:41

A. Well, I would say engineers in the engineering and design department would know who has the expertise of that kind. However, I do not know specifically who those engineers are as I sit here today. 10:07:05 10:07:09 10:07:13 10:07:20 10:07:24

Q. And when you were discussing Hitachi Limited's manufacture of televisions, what 10:07:44 10:07:49

manufacturing facilities are you referring to? 10:07:53

A. Manufacturing in Japan occurred at Gifu 10:08:21

plant, G-i-f-u, as for the details of the production 10:08:28

lines, since I don't handle that, I do not know 10:08:35

well. 10:08:39

Q. And is it the televisions manufactured at 10:08:45

the Gifu plant, were any televisions manufactured 10:08:50

there intended for use in the United States? 10:08:54

MR. ROGER: I'll just object vague as to 10:09:34

time. 10:09:36

BY MS. ANDERSON: 10:09:38

Q. Just to clarify, I'm talking about the 1995 10:09:38

to 2005 time period? 10:09:44

A. I checked with people who are involved with 10:09:56

shipment for the United States at Hitachi Limited 10:09:58

and talked to those people, and those people are in 10:10:02

production control. And I confirmed that the -- 10:10:06

that televisions that manufactured -- that had been 10:10:13

manufactured at the Gifu plant were last shipped in 10:10:17

March of 1989, and therefore, Hitachi Limited TV 10:10:25

business ended at that time. That was the last time 10:10:31

such shipment occurred. 10:10:34

Q. And when you say the last shipment in 1989, 10:10:38

do you mean shipment of televisions to the United 10:10:42

States? 10:10:45

A. That's correct. 10:10:54

Q. And were there other Hitachi entities 10:10:57

manufacturing CRT televisions for sale in the United 10:11:04

States? 10:11:09

A. Well, although I don't know the details, 10:11:31

there may have been local factories outside Japan. 10:11:35

Q. And who at Hitachi Limited would have 10:11:51

information about the location and product lines of 10:11:56

the other factories? 10:11:58

A. I would not know. 10:12:16

Q. Did you make any inquiry with respect to 10:12:20

the production -- withdraw that question. 10:12:23

Did you make any inquiry with respect to 10:12:25

the manufacture of televisions at plants outside of 10:12:27

Japan for sale in the United States? 10:12:35

MR. ROGER: Objection, vague and ambiguous 10:12:37

as to manufactured by whom. He may respond. 10:12:38

THE INTERPRETER: Could I have the question 10:13:15

again? 12:37:58

THE REPORTER: Sure. 12:37:58

(Record read as follows: 10:12:25

"Did you make any inquiry with respect to the 10:12:25

manufacture of televisions at plants outside of 10:12:27

Japan for sale in the United States?") 10:12:35

THE WITNESS: I did not. 10:13:48

MR. ROGER: Could we go off the record for a second? 10:13:49 10:13:51

(Recess taken.) 10:15:48

BY MS. ANDERSON: 10:15:48

Q. And in preparation for today's deposition, did you make any inquiry regarding production facilities outside Japan that are owned by Hitachi Limited? 10:15:48 10:15:51 10:15:55 10:16:00

MR. ROGER: Objection, vague and ambiguous as to "product." 10:16:14 10:16:16

BY MS. ANDERSON: 10:16:22

Q. And I'm referring to the production of CRT televisions? 10:16:22 10:16:24

MR. ROGER: Objection, assumes facts. You may respond. 10:16:32 10:16:37

THE WITNESS: I know the fact that for TVs sold in Japan by Hitachi Limited they were manufactured at Gifu plant. As for overseas production facilities, I do not know, and I did not make any inquiries. 10:17:13 10:17:18 10:17:23 10:17:30 10:17:35

BY MS. ANDERSON: 10:17:38

Q. And during the relevant time period we're discussing, do you know whether any Hitachi brand televisions were sold in the United States? 10:17:38 10:17:44 10:17:47

A. I do not. 10:18:03

Q. Did Hitachi Limited manufacture televisions for -- exclusively to be branded as a Hitachi product? 10:18:04 10:18:18 10:18:30

A. I don't know what you mean. 10:18:36

Q. Did Hitachi Limited manufacture CRT televisions to be sold under another brand? 10:18:42 10:18:47

A. No. 10:19:02

Q. So all the televisions that Hitachi Limited sold were manufactured as a Hitachi brand television; is that accurate? 10:19:02 10:19:05 10:19:10

A. That is correct as far as what concerns in Japan. 10:19:23 10:19:27

Q. And do you have any information about Hitachi Limited plants outside of Japan? 10:19:30 10:19:31

A. No. 10:19:43

Q. Did you make any inquiries to prepare for this deposition with respect to facilities outside of Japan? 10:19:45 10:19:47 10:19:51

A. No. 10:19:58

Q. Do you -- withdraw that question. 10:20:03

Do you know the major components that make up a CRT television? 10:20:13 10:20:16

A. Although I may be wrong, I believe those major components are CRT tuner, power source, and sound circuit, including speakers. 10:20:42 10:20:51 10:20:58

Q. And are any of the components of a CRT television that you described interchangeable between different sizes of CRT televisions? 10:21:05 10:21:09 10:21:13

A. I do not know. 10:21:34

Q. And do you know whether CRTs of the same size can be substituted for one another? For example, if Hitachi Limited was making a TV using a Hitachi CPT, could Hitachi Limited have switched to using a Samsung CPT without changing other specifications of that television? 10:21:39 10:21:44 10:21:51 10:21:56 10:22:01 10:22:05

MR. ROGER: Objection, assumes facts. You may respond. 10:22:07 10:22:10

THE WITNESS: I don't know. 10:22:44

BY MS. ANDERSON: 10:23:52

Q. And you mentioned earlier that you reviewed some of the sales records, how does Hitachi Limited maintain those records? 10:23:52 10:23:58 10:24:02

A. I believe you were referring to my review of past records of 1995. If you're talking about those records, they are at the accounting department, and those records are referred to as sales records or details of profit and loss and they are printed data. 10:24:38 10:24:41 10:24:46 10:24:51 10:24:56 10:25:06

Q. And for records that are after 1995, how are those sales records maintained? 10:25:11 10:25:15

A. When I said I reviewed the past records, I did so in order to confirm that there was no U.S. sales of Hitachi CRTs in 1995 through March of 1996. I checked those records in order to confirm that. So other than that, like the years that you refer to, subsequent years, I do not know how those records are maintained. 10:25:53 10:25:56 10:26:02 10:26:15 10:26:20 10:26:24 10:26:27

Q. And what, if anything, did you do to confirm whether there were sales of CRT televisions bound for the United States after 1996? 10:26:29 10:26:32 10:26:37

A. Well, what I checked was that there were no sales records at the accounting. 10:27:02 10:27:06

MR. ROGER: County? 10:27:23

THE INTERPRETER: Accounting. 10:27:28

BY MS. ANDERSON: 10:27:29

Q. And how did you go about checking that there were no sales records regarding sales of CRT televisors for the United States in the accounting department? 10:27:29 10:27:33 10:27:37 10:27:38

A. I looked through the documents. 10:27:50

Q. And how were those documents maintained? Are they electronically maintained? 10:27:54 10:27:57

A. No, they were printed data. 10:28:04

Q. And do you know what, if any, Hitachi entities sell CRT -- sold CRT televisions in the 10:28:13 10:28:22

United States? 10:28:26

A. I don't know. 10:28:39

Q. And as -- withdraw that question. 10:28:52

As a CRT televisions manufacturer, did 10:29:05

Hitachi Limited generally buy its CPTs from multiple 10:29:10

suppliers? 10:29:19

MR. ROGER: Objection, assumes facts. 10:29:20

THE WITNESS: I don't know about the 10:29:41

suppliers of such components. 10:29:45

BY MS. ANDERSON: 10:29:52

Q. So you don't know who manufactured the 10:29:52

tubes that Hitachi Limited used in its CRT 10:29:54

televisions? 10:29:58

A. It is my understanding that the CRT tubes 10:30:26

that were manufactured at Hitachi's Mobara plant 10:30:30

were used for the televisions sold in Japan. 10:30:34

M-o-b-a-r-a. 10:30:38

Q. Can we go off the record? 10:30:58

THE REPORTER: Sure. 10:51:30

(Recess taken.) 10:51:30

MR. ROGER: Jennie, I just wanted to raise 10:52:18

a point of clarification that we can handle now or 10:52:21

we can handle on my cross-examination. When you 10:52:25

asked him about somebody else's CRT television, for 10:52:28

example, Samsung, I think he understood it as 10:52:32

referring specifically to Samsung. But he does have knowledge about somebody else's CRT going into Hitachi televisions. At your convenience -- (inaudible.) 10:52:35 10:52:39 10:52:41 10:53:07

THE REPORTER: I couldn't hear you. I'm sorry, the last sentence? 10:53:07 10:53:08

MR. ROGER: At your convenience. 10:53:08

MS. ANDERSON: Okay, well, let's try to clarify that point then. 10:53:08 10:53:10

Q. Previously, I had asked whether CRTs of the same size can be substituted for one another, and I gave an example. Let me rephrase that example. 10:53:11 10:53:14 10:53:20

So if Hitachi was making a television using one manufacturer's CPT, could Hitachi switch to using a different manufacturer's CPT without changing other components of the televisions? 10:53:21 10:53:25 10:53:33 10:53:36

A. I don't think so. 10:54:19

Q. Why not? 10:54:21

A. A completed television set has a CRT that fits in that television set. That is the design of that CRT on the television that are matched to each other. If you bring CRT for another product -- another TV and replace just the CRT, I don't think it is possible. That's because all those components are manufactured according to the 10:54:56 10:55:02 10:55:08 10:55:11 10:55:16 10:55:21 10:55:31

specifications. 10:55:34

Q. Okay. So what does a CRT television 10:55:36

manufacturer do if a CPT supplier cannot meet all of 10:55:41

its volume requirements? 10:55:48

MR. ROGER: Objection, assumes facts. You 10:55:51

may respond. 10:55:59

THE WITNESS: As far as Japan, that is 10:56:35

domestic sales are concerned. Hitachi made the 10:56:38

sales plans in consideration of what Hitachi was 10:56:41

capable to manufacture, and therefore, the sales and 10:56:49

manufacturing were balanced. We did not make sales 10:56:55

plans where CRT might be insufficient in number. 10:57:00

BY MS. ANDERSON: 10:57:11

Q. And would the same hold true for Hitachi 10:57:12

worldwide operations? 10:57:16

MR. ROGER: Objection, vague and ambiguous 10:57:27

as to the term "Hitachi." 10:57:29

THE WITNESS: My testimony I just gave is 10:57:43

for Japan. I handled domestic sales, so my response 10:57:49

was limited to what was happening to Japan. 10:57:56

BY MS. ANDERSON: 10:58:02

Q. Do you have any information with respect to 10:58:02

subsidiaries of Hitachi Limited who were 10:58:06

manufacturing CRT televisions? 10:58:09

MR. ROGER: Objection, overbroad. You may 10:58:12

respond. 10:58:14

THE WITNESS: No, my answer is no. 10:58:29

BY MS. ANDERSON: 10:58:32

Q. Did you make any inquiry about operations by Hitachi Limited's subsidiaries? 10:58:32 10:58:38

MR. ROGER: Objection, overbroad. 10:58:49

THE WITNESS: I did not make such inquiries. 10:59:01 10:59:03

BY MS. ANDERSON: 10:59:05

Q. And did you make any inquiries with respect to the manufacture of CRT televisions at factories owned by Hitachi Limited outside Japan? 10:59:05 10:59:11 10:59:16

MR. ROGER: Objection, overbroad, assumes facts. 10:59:32 10:59:34

THE WITNESS: I don't know about overseas production facilities. My understanding is as far as Hitachi Limited is concerned, there was only Gifu plant in Japan for Hitachi Limited. 10:59:57 11:00:03 11:00:06 11:00:12

BY MS. ANDERSON: 11:00:15

Q. Are you aware of other manufacturing facilities that are wholly owned by Hitachi Limited? 11:00:15 11:00:17 11:00:26

MR. ROGER: You use a present tense. Do you mean during the time period? 11:00:26 11:00:29

MS. ANDERSON: Yes, during the time 11:00:30

period. 11:00:31

THE WITNESS: No. 11:00:42

BY MS. ANDERSON: 11:00:42

Q. Did you make any inquiry about those facilities to the degree they exist? 11:00:42 11:00:44

A. No. 11:00:56

Q. With respect to the categories regarding pricing, do you have any information with respect to the pricing of CRT televisions to be sold in the United States? 11:01:01 11:01:06 11:01:10 11:01:16

A. No. 11:01:33

Q. Did you do anything to acquire any such information? 11:01:37 11:01:40

MR. ROGER: Objection, overbroad. 11:01:42

THE WITNESS: It was that there was no U.S. business of the CRT televisions during that period. So I did not ask any questions about pricing of what didn't exist. That's not a realistic question. 11:02:14 11:02:17 11:02:25 11:02:31

BY MS. ANDERSON: 11:02:44

Q. And do you have any information with respect to the sale of CRT televisions in the United States by any Hitachi-owned entity or facility? 11:02:44 11:02:46 11:02:52

A. No. 11:03:13

Q. Did you do anything to obtain information about such sales? 11:03:16 11:03:20

A. I confirmed that there was no Hitachi Limited business with respect to CRT televisions in 1995 and after. 11:03:43 11:03:49 11:03:52

Q. And okay -- for the record, I'll move to strike that as a nonresponsive answer. 11:03:56 11:03:58

The question was whether you did anything to learn about sales of CRT televisions to the United States by Hitachi Limited-owned entity? 11:04:01 11:04:06 11:04:10

MR. ROGER: Objection, assumes facts. You may respond. 11:04:21 11:04:24

THE WITNESS: I did check that Hitachi Limited had no business in the United States on CRT televisions. As for other affiliated companies or facilities overseas, I did not look into the matter. 11:05:07 11:05:12 11:05:15 11:05:19 11:05:22

BY MS. ANDERSON: 11:05:26

Q. Who would have information about the sale of CRT televisions in the U.S. by Hitachi-owned entities at Hitachi Limited? 11:05:26 11:05:30 11:05:36

A. I don't know. 11:05:54

Q. Who would you ask to find out who at Hitachi Limited had that information? 11:05:57 11:06:07

A. Since I had been involved with the sales in Japan, I did not do anything about the overseas operations. And so I do not even know who I can ask 11:06:25 11:06:30 11:06:35

as to who were involved in that operation. 11:06:43

Q. And do you know -- well, withdraw that 11:06:51

question. 11:06:54

Did Hitachi Limited exercise any pricing 11:06:56

authority with respect to CRT televisions over any 11:07:00

of its subsidiaries? 11:07:05

A. I don't know. 11:07:22

Q. Did you do anything to find out that 11:07:25

information in preparation for this deposition? 11:07:30

A. No. 11:07:41

Q. Who at Hitachi Limited would know the 11:07:42

answer to that question? 11:07:45

A. I don't know. 11:07:55

Q. Who would you ask at Hitachi to find out 11:07:56

who would have information about that question? 11:08:01

A. I can't think of anyone. 11:08:13

Q. And who at Hitachi Limited did Hitachi 11:08:16

Limited's subsidiaries report to with respect to the 11:08:20

manufacture and sale of CRT televisions? And by 11:08:23

that, I mean CRT televisions intended for sale in 11:08:40

the United States? 11:08:43

A. I don't know the substance of such 11:08:54

reporting. 11:08:57

Q. Did you make any inquiry about those 11:08:58

reporting of those activities in preparation for 11:09:01

your deposition today? 11:09:05

A. No. 11:09:12

Q. Who would have information about reporting 11:09:14

of those activities? 11:09:17

A. I had no knowledge as to the overseas 11:09:40

sales, so I do not know who would have that 11:09:47

information. On the other hand, if you were asking 11:09:50

me about sales in Japan, I have knowledge about 11:09:53

that. 11:09:57

Q. And what did you do to prepare for this 11:10:18

deposition with respect to Hitachi Limited's 11:10:20

knowledge, use, and tracking of retail prices for 11:10:24

CRT televisions? 11:10:29

A. Well, I refreshed my recollection as to how 11:10:58

Japanese retail pricing was followed. 11:11:01

Q. Did you do anything to learn about whether 11:11:07

Hitachi Limited tracked the retail or street prices 11:11:11

of CRT televisions in the United States? 11:11:16

A. No. 11:11:35

Q. And who at Hitachi Limited would have that 11:11:43

information about whether Hitachi Limited is tracked 11:11:46

during the relevant time period retail or street 11:11:49

prices for CRT televisions in the United States? 11:11:52

A. I don't know. 11:12:14

Q. And did you make any inquiry about who 11:12:22

would have that information in preparation for this deposition? 11:12:24 11:12:28

A. No. 11:12:34

Q. Do you know whether Hitachi Limited contracted with any other entities to build TVs to be sold in the United States? 11:12:36 11:12:39 11:12:44

A. No. 11:12:59

Q. Did you make any inquiries with respect to whether such contracts exist? 11:13:02 11:13:05

A. No. 11:13:14

Q. And did Hitachi Limited contract with any entity to build TVs intended for sale in the U.S. with Hitachi manufactured CPTs? 11:13:16 11:13:20 11:13:28

MR. ROGER: Object to the term "Hitachi" as vague. You may respond. 11:13:47 11:13:50

THE WITNESS: Since I was handling the products of televisions sold in Japan, I don't know the details of how the components are manufactured, except I am aware that the CRTs for the Hitachi televisions were manufactured in the Mobara plant in Chiba prefecture. And the Mobara plant was manufacturing CRTs for the sales of Japan as well as for overseas. Having said that, I don't know any more details beyond that. 11:14:34 11:14:36 11:14:41 11:14:46 11:14:56 11:15:01 11:15:03 11:15:08 11:15:13

BY MS. ANDERSON: 11:15:16

Q. Do you know with respect to the -- withdraw that. 11:15:16 11:15:19

With respect to CRTs manufactured for overseas, were those CRTs being manufactured for use by another Hitachi entity? 11:15:22 11:15:27 11:15:35

A. I don't know the details of the CRT business because that was not my expertise. 11:16:04 11:16:07

MS. ANDERSON: I have no further questions for the witness today. However, for the record, plaintiffs reserve their right to seek additional witnesses knowledgeable about these topics. It is not our view that preparing a witness to talk about exclusively sales in Japan, when those are not relevant to this litigation, is appropriate. And so we, therefore, reserve our rights as stated. 11:16:27 11:16:28 11:16:35 11:16:38 11:16:41 11:16:46 11:16:50 11:16:54

MR. ROGER: This witness was not prepared to talk about sales exclusively in Japan. Again, we stated several times, and the witness has so testified that Hitachi Limited, which is the entity you requested a representative for, did not sell televisions into the United States during the class period. And by way of example, you've had a day of deposition testimony from the 30 (b)(6) witness of Head U.S. who told you about the U.S. CRT and television market. Head U.S. was the entity that 11:17:01 11:17:02 11:17:08 11:17:10 11:17:15 11:17:18 11:17:21 11:17:25 11:17:29 11:17:33

was responsible for those matters during the class period, not Hitachi Limited. 11:17:38 11:17:40

MS. ANDERSON: Actually, Head U.S. was only proffered with respect to tubes. In any event, we can agree to disagree on this. 11:17:44 11:17:47 11:17:50

MR. ROGER: Of course we can. 11:17:52

MS. ANDERSON: And we certainly do. 11:17:53

MR. ROGER: You've had testimony, and the record will reflect you've had testimony about sales of televisions in the United States from the Head U.S. representative. 11:17:55 11:17:56 11:17:57 11:17:58

MR. MOORE: State of California reserves the right to depose corporate representatives on other topics that have not been noticed by -- (inaudible.) 11:18:02 11:18:04 11:18:09 11:18:15

THE REPORTER: I'm sorry, I can't hear you. 11:18:15

MR. MOORE: The State of California reserves the right to depose corporate representatives on other topics that have not been noticed in this current round of Federal Rules of Civil Procedure 30 (b)(6) depositions pursuant to the protocol entered into the MDL -- the federal MDL -- 11:18:15 11:18:17 11:18:19 11:18:21 11:18:25 11:18:31 11:18:35

THE REPORTER: MDL you said? 11:18:36

MR. MOORE: MDL. 11:18:36

MR. ROGER: And for the record, we do not accept that there is any right that can be reserved to do such a thing. We note that this 30 (b)(6) deposition was noticed on behalf of the direct -- the indirect purchaser plaintiffs, Attorney Generals of both the State of Florida and the State of California. 11:18:36 11:18:38 11:18:41 11:18:44 11:18:52 11:18:56 11:18:58

MR. MOORE: The State of California further reserves the right to notice the deposition of those individuals whom have been designated to give testimony in the corporate capacity in this 30 (b)(6) round of depositions, in their individual capacity at a later date in accordance with protocol. 11:18:58 11:19:01 11:19:03 11:19:07 11:19:10 11:19:13 11:19:16

(Time Noted: 11:19 a.m.) 11:19:20

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on _____, 2012, at_____,_____.

_____

TORU IWASAWA

STATE OF CALIFORNIA) ss:
COUNTY OF MARIN)

I, ASHLEY SOEVYN, CSR No. 12019, do hereby certify:

That the foregoing deposition testimony was taken before me at the time and place therein set forth and at which time the witness was administered the oath;

That the testimony of the witness and all objections made by counsel at the time of the examination were recorded stenographically by me, and were thereafter transcribed under my direction and supervision, and that the foregoing pages contain a full, true and accurate record of all proceedings and testimony to the best of my skill and ability.

I further certify that I am neither counsel for any party to said action, nor am I related to any party to said action, nor am I in any way interested in the outcome thereof.

IN THE WITNESS WHEREOF, I have transcribed my name this 23rd day of July, 2012.

ASHLEY SOEVYN, CSR 12019

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EXHIBIT 16

(FILED UNDER SEAL)

EXHIBIT 17

(FILED UNDER SEAL)

EXHIBIT 18

Placeholder

Document produced in native format

CDT Demands Forecast

(Mpcs)

		'90	'91	'92	'93	'94	'95	'96	'97	'98	'99	2000	2001	2002	2003	2004	2005	2006	2007	CAGR ('00-'05)
Korea	14"	4.8	6.2	7.4	8.3	9.2	7.0	6.9	3.0	0.9	0.4									
	15"	0.1	0.2	0.3	1.0	1.9	4.9	6.0	7.6	6.6	5.8	3.1	1.2							
	17"		0.1	0.2	0.3	0.4	1.9	2.6	4.2	4.6	8.6	9.4	7.7	6.5	5.2	4.1	3.2	2.2	1.0	-19.4%
	19"									0.3	1.0	2.5	2.6	3.0	3.0	3.0	2.9	2.6	2.4	3.0%
	20"/21"				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.4	0.5	0.5	0.5	0.5	0.5	20.1%
	Total	4.9	6.5	7.9	9.7	11.6	13.9	15.6	14.9	12.5	15.9	15.2	11.9	9.9	8.7	7.6	6.6	5.3	3.9	-15.4%
Japan	14"	2.2	1.8	1.3	1.2	0.5														
	15"	0.5	0.8	1.2	1.0	0.8	0.5	0.6	0.4	0.4	0.4	0.6								
	17"	0.2	0.6	1.2	1.0	1.0	1.0	2.4	2.6	2.9	1.4	1.2	0.7	0.6	0.4	0.2	0.1			-39.2%
	19"								0.3	0.5	0.7	0.6	0.6	0.6	0.6	0.4	0.4	0.3	0.3	-7.8%
	20"/21"	0.7	0.9	0.7	1.0	1.1	1.7	2.0	2.6	2.0	2.0	1.7	1.7	1.5	1.4	1.4	1.3	1.1	1.1	-5.2%
	Total	3.6	4.1	4.4	4.2	3.4	3.2	5.0	5.9	5.8	4.5	4.1	3.0	2.7	2.4	2.0	1.8	1.4	1.4	-15.2%
Taiwan	14"	7.4	9.5	10.4	10.4	8.4	5.8	5.8	5.1	1.1	0.1	0.1								
	15"	0.1	0.6	1.0	2.0	3.6	5.4	6.2	6.2	5.2	3.2	0.7	0.2							
	17"		0.1	0.2	0.6	0.9	3.6	4.0	5.4	8.3	7.0	1.8	1.5	0.8	0.3	0.2	0.1			-43.9%
	19"								0.4	1.5	2.3	0.7	0.8	1.3	1.6	1.6	1.4	1.2	1.0	14.9%
	20"/21"					0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	5.9%
	Total	7.5	10.2	11.6	13.0	13.0	15.1	16.3	17.4	16.4	12.9	3.6	2.9	2.5	2.3	2.2	1.9	1.5	1.3	-12.0%
China	14"		0.8	1.7	2.8	3.4	4.5	4.4	7.0	8.6	4.9	5.1	2.8	1.6	0.8					
	15"						1.0	2.2	3.8	7.8	15.1	17.9	18.2	19.8	19.1	18.3	17.4	17.0	16.5	-0.6%
	17"							0.1	0.6	1.8	10.3	20.1	25.3	28.9	32.3	34.6	38.4	39.5	41.1	13.8%
	19"										0.7	2.1	3.1	4.1	5.0	5.9	6.5	6.5	6.7	25.4%
	20"/21"											0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.5	14.9%
	Total		0.8	1.7	2.8	3.4	5.5	6.7	11.4	18.2	31.0	45.4	49.6	54.6	57.4	59.1	62.7	63.5	64.8	6.7%
S.E.Asia	14"	0.8	1.2	1.5	3.2	6.7	9.6	8.3	5.2	4.3	2.7	2.6	1.1	0.5						
	15"		0.1	0.2	0.7	1.4	3.8	4.8	7.4	9.3	10.6	9.9	9.5	9.3	8.7	8.3	8.2	7.5	4.8	-3.7%
	17"						1.0	1.3	3.3	3.6	7.8	10.4	13.2	15.2	16.5	18.3	19.0	18.4	17.3	12.8%
	19"										0.2	1.0	1.5	2.1	2.7	3.2	3.2	3.4	3.6	26.2%
	20"/21"											0.1	0.1	0.3	0.3	0.4	0.4	0.5	0.5	32.0%
	Total	0.8	1.3	1.7	3.9	8.1	14.4	14.4	15.9	17.2	21.3	24.0	25.4	27.4	28.2	30.2	30.8	29.8	26.2	5.1%
Europe	14"	1.2	1.7	1.8	2.2	1.8	1.3	1.2	0.9	0.7	0.2									
	15"	0.1	0.3	0.5	0.6	0.6	0.6	1.2	1.4	2.2	2.8	2.1	1.6	1.1	0.7	0.5				-100.0%
	17"			0.1	0.2	0.4	0.6	0.9	2.2	2.4	3.8	4.2	4.7	5.2	5.4	5.6	5.8	5.4	4.3	6.7%
	19"									0.1	0.2	0.6	0.8	1.0	1.2	1.3	1.5	1.5	1.6	20.1%
	20"/21"						0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.3	0.4	0.4	0.4	32.0%
	Total	1.3	2.0	2.4	3.0	2.8	2.7	3.5	4.7	5.6	7.2	7.0	7.2	7.5	7.6	7.7	7.7	7.3	6.3	1.9%

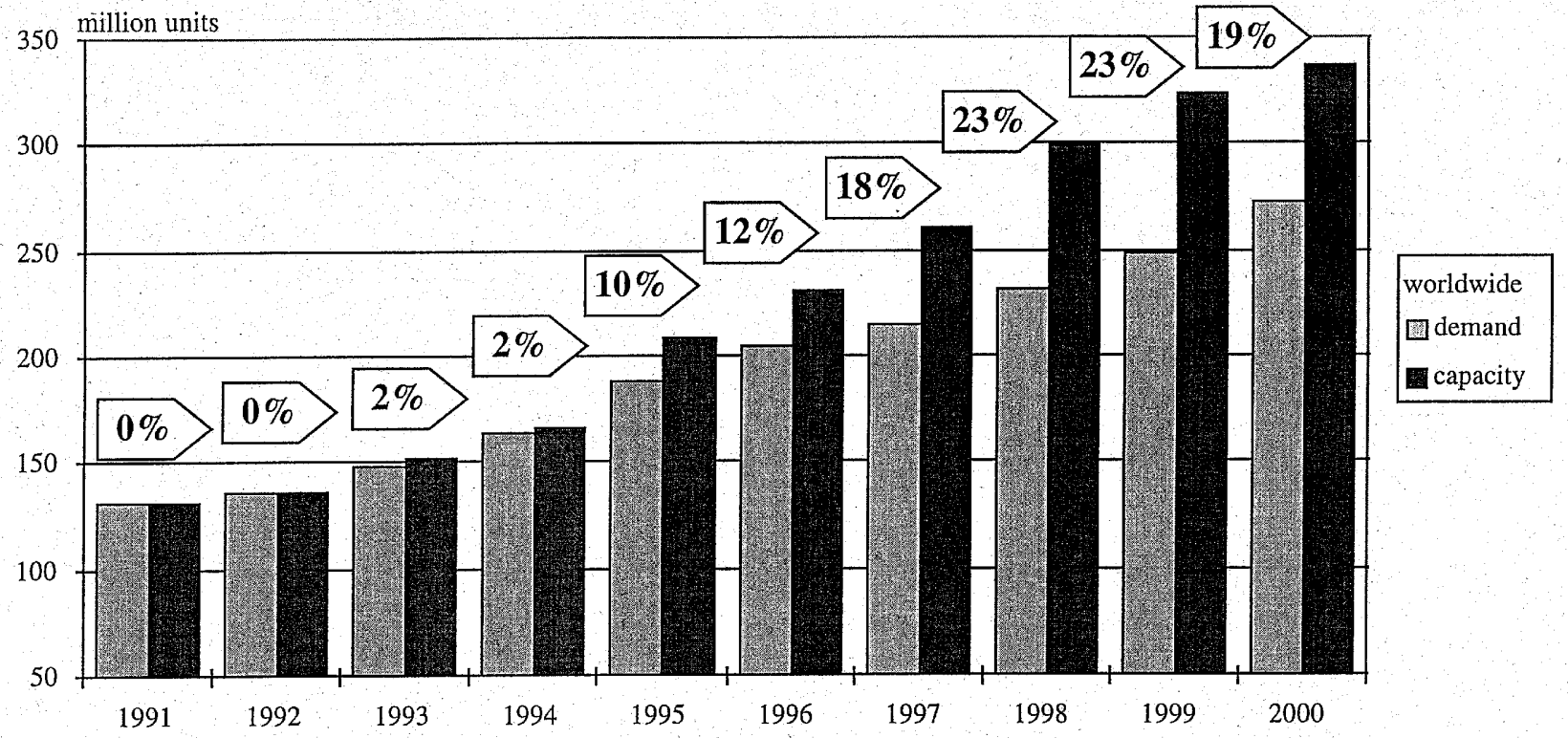
		'90	'91	'92	'93	'94	'95	'96	'97	'98	'99	'2000	'2001	'2002	'2003	'2004	'2005	'2006	'2007	CAGR ('00-'05)
Nafta	14"	0.7	1.0	1.0	1.1	1.2	1.0	1.0	1.0	1.1	0.5	0.2								
	15"		0.2	0.3	0.5	0.6	0.9	1.3	1.5	4.2	4.4	2.6	2.1	2.0	1.5	1.1	0.4			-31.2%
	17"				0.1	0.2	1.2	2.4	2.9	3.1	5.4	6.5	7.5	7.7	8.4	8.5	8.9	8.0	7.1	6.5%
	19"									0.1	0.5	1.8	2.2	2.3	2.4	2.9	3.1	3.0	2.8	11.5%
	20"/21"											0.1	0.1	0.2	0.4	0.5	0.5	0.6	0.6	38.0%
	Total	0.7	1.2	1.3	1.7	2.0	3.1	4.7	5.4	8.5	10.8	11.2	11.9	12.2	12.7	13.0	12.9	11.6	10.5	2.9%
Others	14"					0.1	0.2	0.5	0.6	0.5	0.5	1.4	1.2	0.4	0.2					
	15"						0.1	0.1	0.1	0.4	0.7	2.0	3.1	3.8	4.0	4.2	4.0	3.5	3.2	14.9%
	17"									0.1	0.4	0.4	0.8	1.8	2.3	2.7	3.3	3.8	4.2	52.5%
	19"														0.3	0.4	0.6	0.8	0.9	
	20"/21"																			
	Total					0.1	0.3	0.6	0.7	1.0	1.6	3.8	5.1	6.0	6.8	7.3	7.9	8.1	8.3	15.8%
Total	14"	17.1	22.2	25.1	29.2	31.3	29.4	28.1	22.8	17.2	9.3	9.4	5.1	2.5	1.0					
	15"	0.8	2.2	3.5	5.8	8.9	17.2	22.4	28.4	36.1	43.0	38.9	35.9	36.0	34.0	32.4	30.0	28.0	24.5	-5.1%
	17"	0.2	0.8	1.7	2.2	2.9	9.3	13.7	21.2	26.8	44.7	54.0	61.4	66.7	70.8	74.2	78.8	77.3	75.0	7.9%
	19"								0.7	2.5	5.6	9.3	11.6	14.4	16.8	18.7	19.6	19.3	19.3	16.1%
	20"/21"	0.7	0.9	0.7	1.1	1.3	2.3	2.6	3.2	2.6	2.6	2.7	3.0	3.2	3.5	3.8	3.9	3.9	3.9	7.6%
	Total	18.8	26.1	31.0	38.3	44.4	58.2	66.8	76.3	85.2	105.2	114.3	117.0	122.8	126.1	129.1	132.3	128.5	122.7	3.0%
Growth Rate	14"		29.8%	13.1%	16.3%	7.2%	-6.1%	-4.4%	-18.9%	-24.6%	-45.9%	1.1%	-45.7%	-51.0%	-60.0%					
	15"		175.0%	59.1%	65.7%	53.4%	93.3%	30.2%	26.8%	27.1%	19.1%	-9.5%	-7.7%	0.3%	-5.6%	-4.7%	-7.4%	-6.7%	-12.5%	
	17"		300.0%	112.5%	29.4%	31.8%	220.7%	47.3%	54.7%	26.4%	66.8%	20.8%	13.7%	8.6%	6.1%	4.8%	6.2%	-1.9%	-3.0%	
	19"									257.1%	124.0%	66.1%	24.7%	24.1%	16.7%	11.3%	4.8%	-1.5%	0.0%	
	20"/21"		28.6%	-22.2%	57.1%	18.2%	76.9%	13.0%	23.1%	-18.8%	0.0%	3.8%	11.1%	6.7%	9.4%	8.6%	2.6%	0.0%	0.0%	
	Total		38.8%	18.8%	23.5%	15.9%	31.1%	14.8%	14.2%	11.7%	23.5%	8.7%	2.4%	5.0%	2.7%	2.4%	2.5%	-2.9%	-4.5%	

EXHIBIT 19

CONFIDENTIAL

'98_3.11
EECA
資料

Structural overcapacity CRT industry



based on public announcements

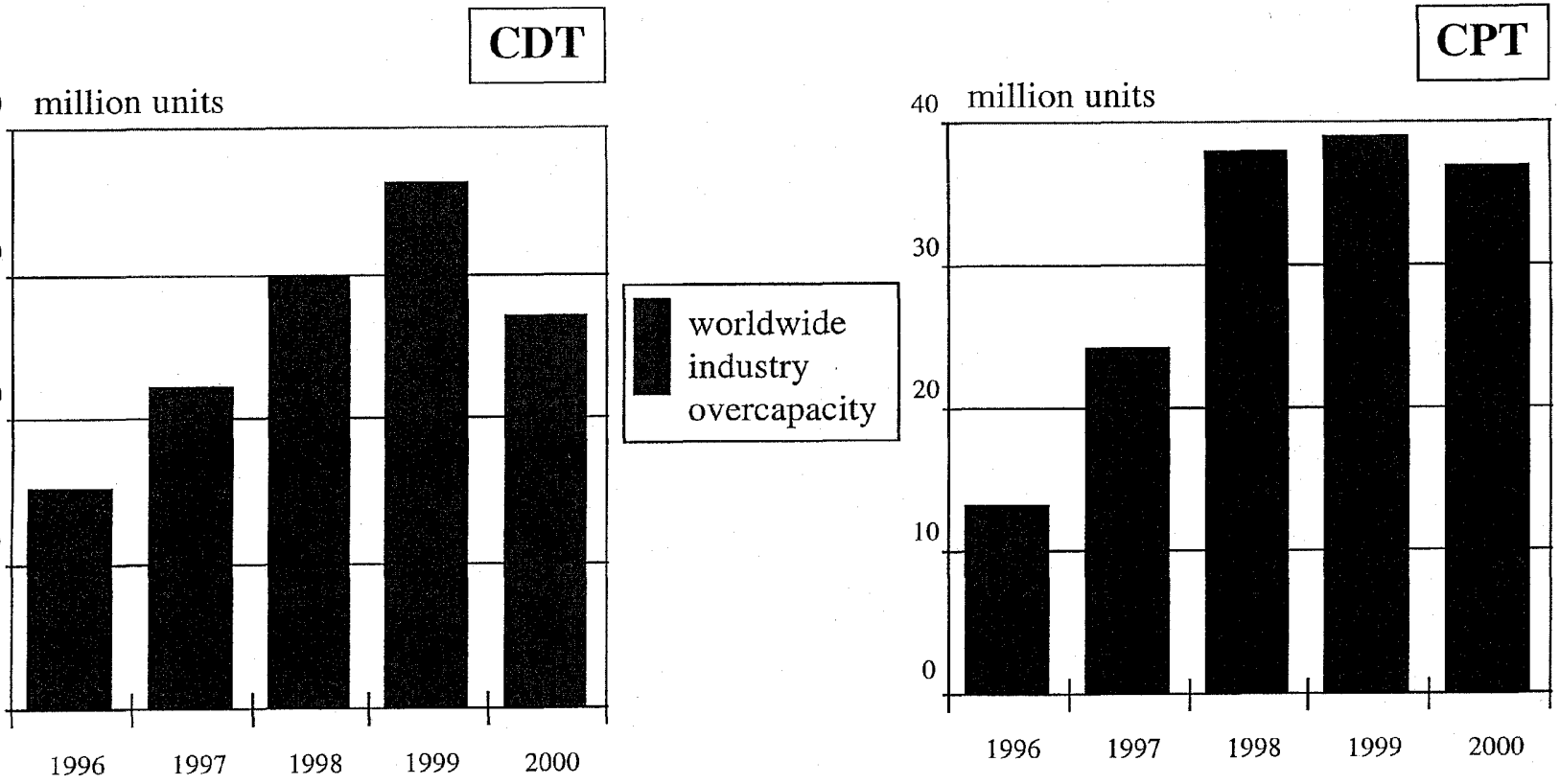
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CONFIDENTIAL

Structural overcapacity CRT industry



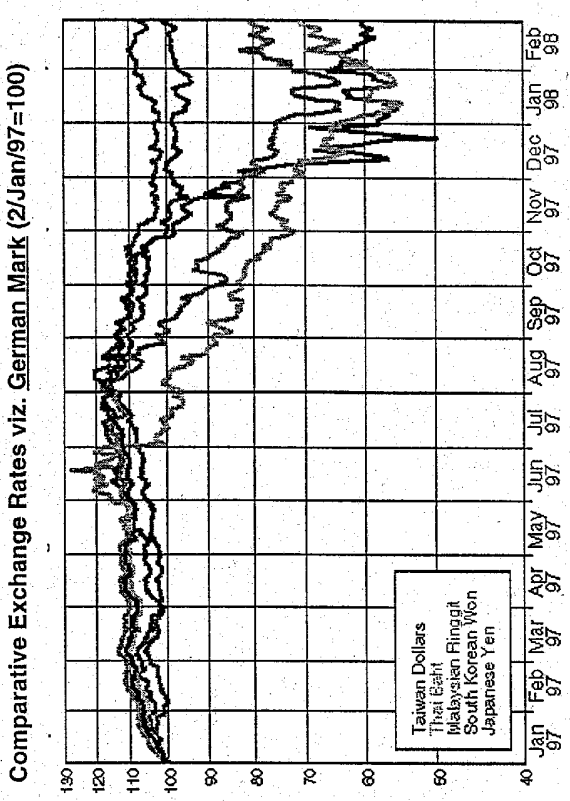
based on public announcements

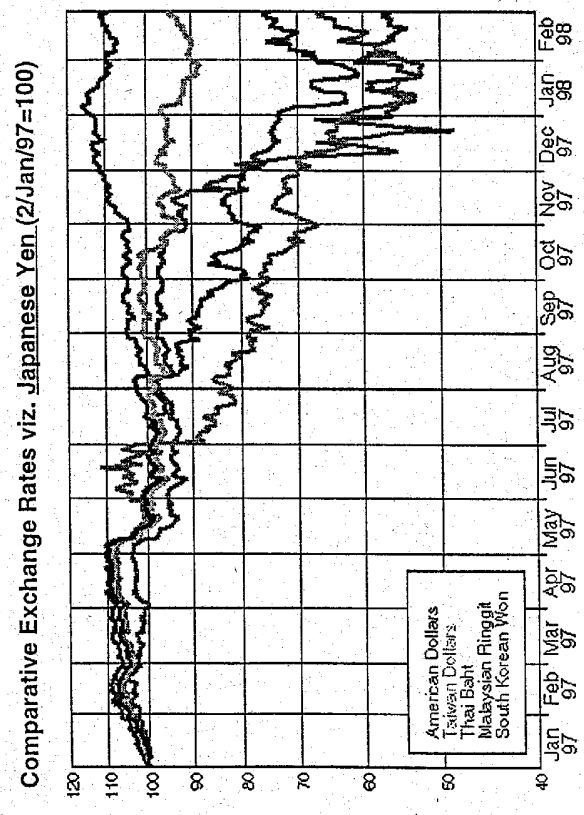
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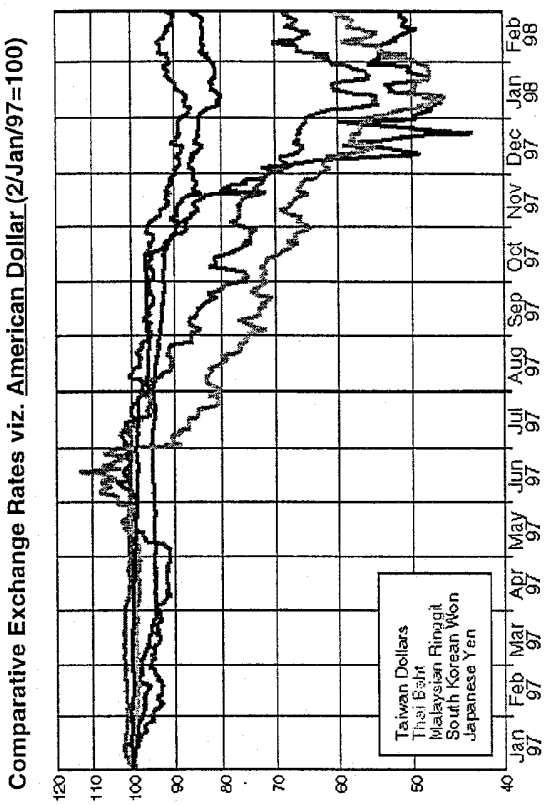
Currency Turmoil Affects Both Japanese Yen and DM

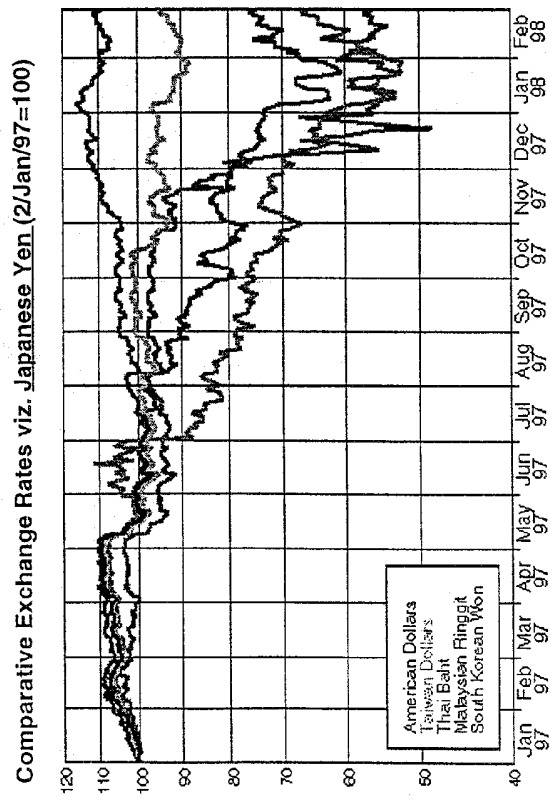




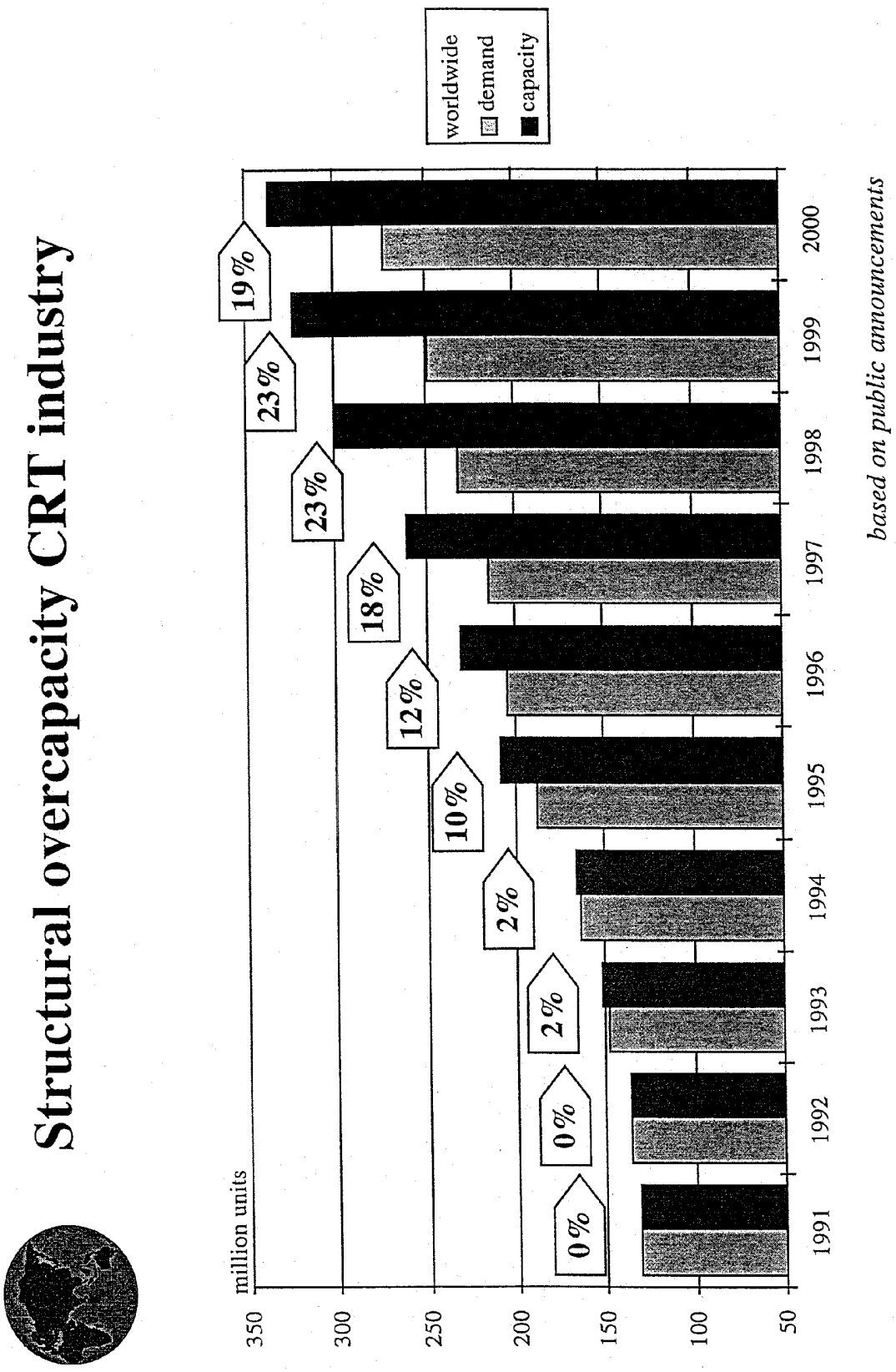
通貨はその国に対内投資がくる。

Currency Turmoil Affects Both Japanese Yen and US $





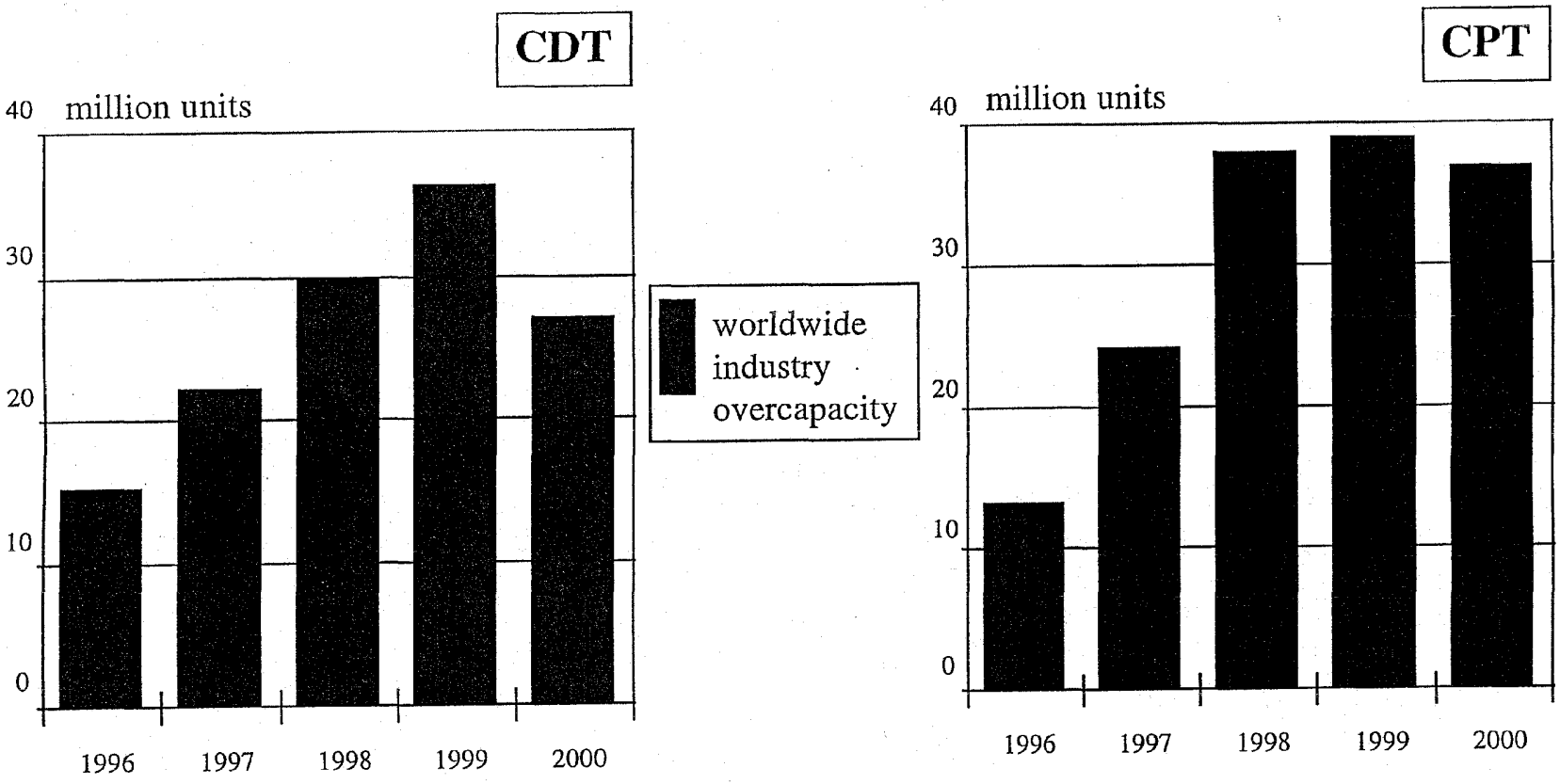
Structural overcapacity CRT industry



based on public announcements

CONFIDENTIAL

Structural overcapacity CRT industry



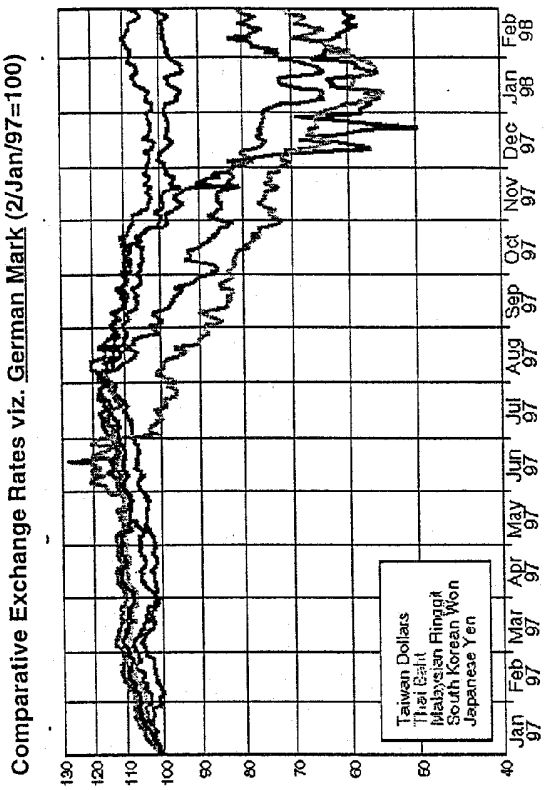
based on public announcements

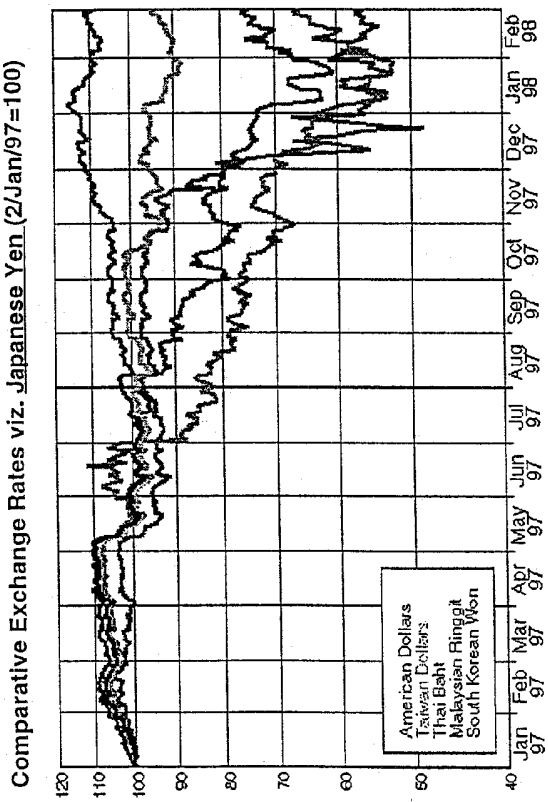
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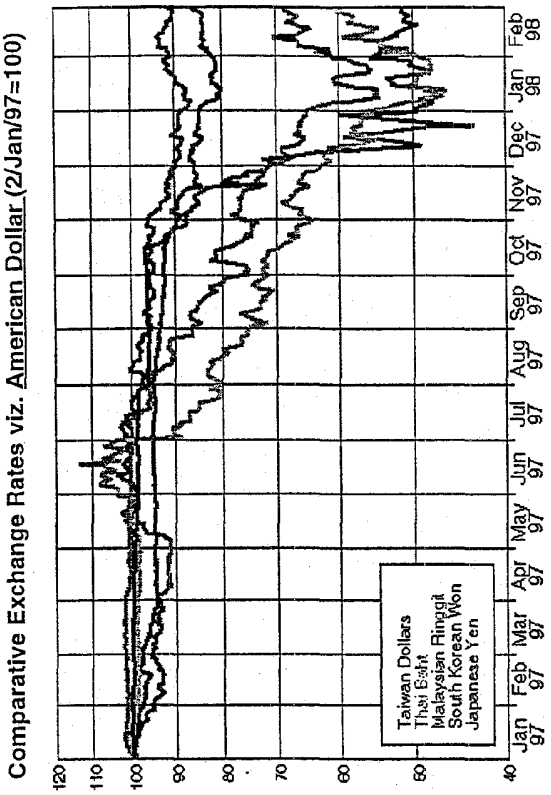
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Currency Turmoil Affects Both Japanese Yen and DM





Currency Turmoil Affects Both Japanese Yen and US $



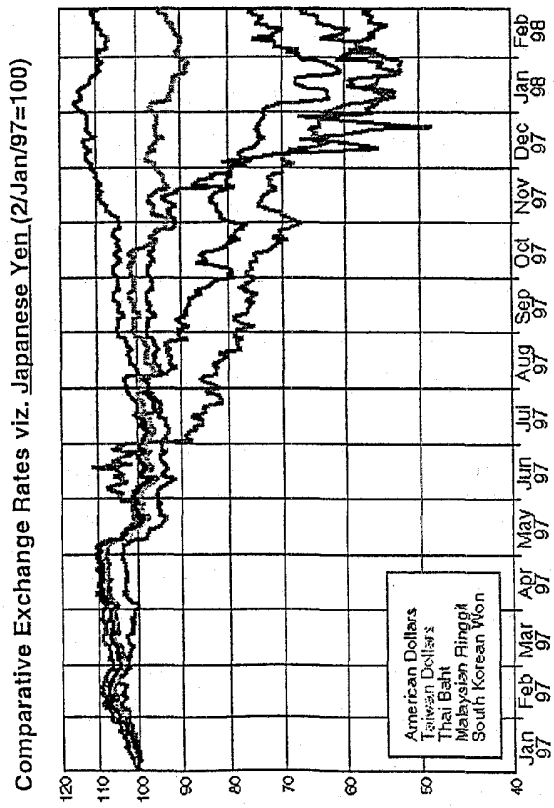


EXHIBIT 20

(FILED UNDER SEAL)